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NEWS IN BRIEF

NEWSPAPER

Ervin Charges Army Spying 'Far Greater'

WASHINGTON, D.C. – Army surveillance of lawful civilian activity was "far greater than we imagined," Sen. Sam J. Ervin (D-N.C.) has charged in releasing a new report on "Army surveillance computers."

The Army "appears to have had" more than 350 separate record centers, where substantial files on civilian political activity were maintained, Ervin said.

The report, released last Wednesday, charged the Army with maintaining separate file centers "in virtually every major stateside Army unit."

Specifically, Fort Sam Houston in Texas had 120,000 file cards on "personalities of interest," the report claimed, "and at Fort Holabird [Md.] 313,250 entries on organizations and 152,000 records on individuals" were kept.

Honeywell to Increase Equipment, Support Prices

WALTHAM, Mass. – Honeywell Inc. will increase prices on equipment for users who were partially affected by the company's price hike last year. Some contracts did not permit the maximum increase authorized last year by the Price Commission and these customers may now have to pay more, a spokesman said.

Some Honeywell lease contracts written since January 1970 restrict the vendor from raising prices more than 2% per year. Last year the price commission gave Honeywell approval to raise prices from 4% to 5%. Some users covered by the restrictive contracts were hit with only the allowable 2%.

These users will now be levied with the remainder of the hike approved by the government, a spokesman said. New lease contracts restrict Honeywell from raising prices during the first year, he stated.

Honeywell also increased its hourly contract maintenance charge from $30 to $34 and its "call-in" rate from $36 to $41, effective immediately.

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Government Savings Reported

Measuring Tools Get GAO Blessing

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – Computer performance evaluation techniques – both hardware and software – can dramatically increase the productivity and efficiency of computer systems, according to a recent report from the General Accounting Office (GAO).

Since the use of such techniques can result in "substantial savings to the government by eliminating or postponing the need for additional equipment," GAO has recommended that their use be encouraged by the Office of Management and Budget for government-wide use.

To reach these conclusions, GAO, often called the congressional "watchdog," studied several government installations that had used the devices and found savings in the range of 20% to 40% common.

The major study was made at the National Aeronautics and Space Administration's Goddard Space Flight Center, which operates 225 computers.

Goddard presently uses "one electronic monitoring device and two special computer programs for measuring the use of computer systems components. Goddard personnel used the data obtained from these measurement tools to continuously analyze the performance of its computer operations."

In an in-depth study of five of the Goddard systems, GAO found the agency had increased the number of jobs processed on one computer from about 12,000 in August 1969 to about 18,000 in March 1971, "with a slight decrease in the number of hours of computer use."

The improvements were made possible, GAO said, because of the correction of inefficiencies in the system's configuration, scheduling procedures and workload priorities.

"These inefficiencies were identified through computer performance evaluation," GAO stated.

In another case, the study found that the number of jobs processed was increased from 20,000 in March 1969 to about 25,000 in March 1971, with about a 10% increase in the number of hours of computer use and a 7% increase in the utilization of the central processing unit.

"Similar improvements were achieved on the three other Goddard systems that we reviewed," GAO said.

In all, the study found that computer time worth at least $433,000 annually was saved through the use of these techniques and the acquisition of a more efficient compiler.

"The one-time cost of making the changes was estimated at $60,000," the study team added.

Defense Savings

The Army Materiel Command has also conducted tests of software computer evaluation techniques, GAO reported.

"Substantial increases in the system and program efficiency were reported by the testing agency.

"For example, one group of frequently used programs took 62 minutes of computer time before they were evaluated by using the measurement tool. According to the test report, running time for these programs was reduced to 18 minutes after inefficiencies identified by the tool had been corrected.

"This represented," GAO reported, "a 71% decrease in computer time."

In another case, this time at the Army Systems Support Agency, the GAO study team found that "use of these techniques had enabled improvements in scheduling and other areas, which resulted in in-

(Continued on Page 2)

Tested Vote System Felled By Programmer's Error

REDFORD, Mich. – A programming error caused thousands of votes to be miscounted in a recent primary election here, although the computerized voting system had passed a state-run accuracy test and the accuracy checks built into the system certified that it was working properly.

And officials admit the error might not have been caught, except for the fact that an alert election official became suspicious of the results of one race where the candidates were running unopposed.

"If those two candidates had had competition in their races, I don't think the problem would have ever been caught," one official admitted last week.

The error was especially serious in that the initial, incorrect results indicated that a property tax proposition had been defeated by over 1,000 votes, while in reality the measure passed by just over 100 votes.

George Sterstick, a computer voting specialist in the Michigan Secretary of State's Office, explained the problem:

On the voting card there were three punch positions in the F row. The first two (18 and 114) were for Republican candidates in the trustee race, running unopposed. The third position (213) was for the tax proposal question.

A voter should have been able to punch all three positions and have the computer count them.

But this was never written into the program, so when position 114 and 213 were both punched the system would not count the votes, since it was programmed to indicate those were conflicting votes, and therefore not valid.

"This was just a case of the programmer not anticipating the potential problem," according to Herstick.

"I don't really understand how it worked, but it did happen," according to Redford Township Clerk Ruth Sullivan, who first became suspicious of the system.

It seemed strange, she said, that one of the unopposed Republican candidates was getting several hundred more votes in each of the town's 49 precincts than the other unopposed candidate.

"In an election like this, with no opposition, you would expect the totals to be fairly close. Since the candidates were both of the same party, you would expect most of the Republicans to vote for both of them and not just one."

Checks Out System

She checked the accuracy tests built into the program and they confirmed it was operating all right. In addition, she said the "printout looked good" and it

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Rap Sheet 'Exposure' Greater, Penalties Stiffer Under Bill

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – More people than ever before could have access to the records in the FBI's Computerized Criminal History data bank of arrest records, but the penalties for misuse of the data would also be higher under a Nixon Administration-sponsored bill currently before Congress.

The bill (S. 3834) was introduced into the Senate by Sen. Roman Hruska (R-Neb.) at the request of the Justice Department in response to a U.S. District Court decision that banned the dissemination of such files outside the U.S. Government or local law enforcement agencies.

At the same time, the act would require the bureau to notify an individual if it planned to disseminate the information for non-law-enforcement purposes.

The act would require the bureau to open the files to the individual and allow him to correct or update inaccurate or misleading information. In the past, the FBI never had to notify an individual if it maintained a file on him, even if the the information was disseminated to non-law enforcement personnel.

Employment Purposes

Under the proposed act the criminal history or "rap sheet" files could be shared with officials of certain federally connected banks and with state and local officials for employment and licensing purposes – officials who were allowed access to the records under FBI regulations before the Menard vs. Mitchell decision.

In addition, the new measure would allow the state and local agencies to receive records for non-law enforcement purposes for "maintaining security within that agency or within a business, industry, profession or lahor organization" – new categories not previously permitted.

It would also permit the dissemination of rap sheets to foreign governments for

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Computerized Voting System Felled by Programmer Error

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was hard to find the source of the error by studying it.

Finally, the township contacted the state experts who agreed that something was amiss, but they could not isolate the problem quickly, thus causing the Wayne County Board of Canvassers to suspend certification of the tax vote until a new canvass coud be run.

The programmer involved was brought in to work with the staff officials and township workers and the problem area was discovered and corrected.

To make sure that the program was running accurately after it was modified, the township hand-counted the ballots from one precinct to make sure it came up with the same answers as the computer on the second try.

"They said we didn't have to do the hand count since the system was fixed," Sullivan said, "but I did it anyway for my peace of mind. I wouldn't want another error to be missed."

Sullivan said she was surprised at the error, since the system had been tested a week prior to the election by state officials.

"We sent test decks for testing from all 49 precincts," she said, "even though we only had to send 13. They checked out perfectly."

The test decks are punched with a constant module and run through the system to make sure that the total recorded by the computer was in fact the total put into the machine.

In this type of test, each card is punched in several identical places. Therefore the total votes for each of those propositions should equal the total number of cards entered into the system.

"It would be almost mathematically impossible to punch every combination of punches possible on the ballot in the test decks," she admitted, noting: "We obviously didn't punch the particular combination that caused us problems on election night."

The township, which has run one other computerized election, is going to stick with the system, Sullivan said, but from now on she will run a hand count on four precincts to check the computerized results.

In the recent primary, 1,688 "yes" votes for the property tax proposal were negated by the system – which was enough to reverse the countywide results on the issue.

While this was the only vote to be reversed by the error, election officials noted the same problem also occured in two other places on the ballot – where votes for candidates and propositions were mixed in the same row. In each of those cases a vote for a candidate and for the proposition also canceled out and weren't registered by the computer system. But the error did not change the outcome of those races.

The vote on the tax case was particularly critical, officials explained, because the defeat of the measure would have meant a cutback in county services.

The tax produces about $13 million annually for the county which had planned to begin layoffs of county employees in December of this year in anticipation of the lost revenues.

But now the county will be able to maintain its staff and services at their current level, officials said.

How Many Others?

It is impossible to tell how many other times such errors have occurred and gone undetected, election officials said.

"I think the chances of such an error are slight," Herstick said, "but I can't say positively that it has not happened elsewhere.

"How could we tell if no one discovered the problem."

The experience with the computer system in this election "has made me wonder how many other times it has happened around the country," Sullivan said.

"We have caught inaccurate programs with bugs in them in the past through our testing procedure," she stated, "but this one passed all the tests with flying colors.

"How can you tell that it is not working when every test says it is running perfectly?"

'Slower' Hand Counting Proves Faster

BOISE, Idaho – Hand counting beat computer vote counting in several counties during recent primaries here, even though the computer worked perfectly.

The main problem, however, was that the computers did not have enough votes to count because of human delays, election officials said.

In small precincts, they explained, ballot counting takes place all day long and a running total is kept. In a county with only 280 voters, therefore, the computer system, with its transportation problems, was much slower than the hand counts.

However, in the larger counties, the vote count was delayed because the votes were not picked up often enough from the local precincts. In one county, with over 40,000 voters, it was reported that the first ballots were not picked up until late in the afternoon and the remainder was not picked up until late in the evening, delaying the computer count and making it last longer than the previous manual system.

The officials promised they would have a more efficient delivery system in operation for the next round of elections.

Measuring Devices Endorsed

(Continued from Page 1)

creasing the average number of computer jobs processed each month from 5,700 to about 7,150 and in achieving a significant reduction in the number of hours the computer was used."

But even though the government agencies experienced in using the monitoring devices unanimously reported successful results, the study found that the techniques were used in only three of 10 other government installations visited.

Recommendations Outlined

Since the government now spends between $4 billion and $6 billion a year to operate its computer facilities, GAO recommended the using agencies to "consider using performance measurement tools for identifying inefficiencies which reduce computer productivity.

"We were unable to obtain or make a reliable estimate of the potential government-wide savings that could be achieved by improving the efficiency of computer programs," the team admitted.

"Our review indicated, however, that improving the efficiency of computer programs should result in substantial savings in computer time at most government computer facilities. On a government-wide basis, these savings could amount to computer time worth many millions of dollars each year."

Officials at the National Bureau of Standards "esimated that using electronic monitoring devices to evaluate the performance of the government's 458 largest computers (each of which is valued at more than $1.5 million and costs about $1.7 million a year to operate) would permit improvement in computer utilization resulting in savings of many millions of dollars by avoiding equipment lease and purchase costs," GAO noted.

In conclusion, the report said: "GAO recognizes that there are many problems to be overcome before maximum practical use of these techniques is achieved. GAO believes, however, that with strong leadership . . . worthwhile savings can be achieved in the near future and very sizable savings can be achieved when the availability of trained personnel and equipment makes the government-wide use of these techniques feasible."

In addition to recommending that the government begin training programs to acquaint users with the potential of monitoring systems, GAO also recommended that the government should "encourage" manufacturers to design "built-in" computer performance evaluation techniques.

Comdr. Hopper Honored

WASHINGTON, D.C. – Now officially retired from the Univac Division of Sperry Rand Corp., Navy Commander Grace M. Hopper continues to receive accolades from the DP community.

This summer she was cited by two educational institutions for her contributions to computing.

The Newark College of Engineering awarded her an honorary degree, Doctor of Engineering, and Yale University presented her with a special alumna award, the Wilbur Cross Medal.

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Panel on Shared Systems Told

'Insurance May Be Cheaper Than Security'

By Edward J. Bride
Of the CW Staff

BOSTON – Shared systems users may find it cheaper to insure their data than to develop secure software, according to security experts in a panel discussion here recently.

There have been "enough scares lately" so that users are more concerned over data security, according to Clark Weissman, who suggested banking and insurance companies are in the forefront of developing a security attitude.

Weissman, chief technologist for System Development Corp., said "security is not an absolute," but a relative item that is difficult to define without also defining an environment and other user circumstances.

Insurance Cheaper?

"Insurance may be cheaper than security," Weissman said. Other members of the panel, which mainly discussed shared systems, said the unpredictability of user needs, multiplicity of security levels and the large size of security-oriented instructions for data base applications raise the cost of security.

Consultant James P. Anderson said the operator of a shared system could guarantee security only to the extent that he could govern the uses or applications. He also noted systems cannot normally detect penetration by a "malicious user."

James P. Anderson
. . . not "a benign universe"

New approaches are needed in the design of operating systems and hardware, Anderson noted.

Management, Technical Issue

The panelists agreed that security is a management, as well as a technical problem. Anderson claimed the "main problem is the assumption of a benign universe" of users. The other panelists agreed that unintentional disclosure of information is becoming less frequent, but that malicious penetration appears to be unstoppable, with current technology.

A member of the audience commented that much security research is being done in an academic environment, while commercial users must be consistently mindful of time and money expended to develop secure systems.

"We need a simpler view of what is being done," commented the attendee.

Weissman emphasized the management aspects of security, noting security is like quality – it should be "built into the product" – and should not be an afterthought. Some members of the audience thought differently, noting the problem is not the design of secure systems, but the implementation of available technology.

Jerome Saltzer of MIT's Project MAC said users often do not know what their future security needs will be, and must learn to predict them.

Maj. Roger Schell of the security branch of the Air Force's Electronic Systems Division, at nearby Hanscom Field, emphasized that normally systems can prevent accidental penetration.

The problem, he noted, is how to protect a system from malice i.e., from intentional tapping by users or others unauthorized to access data.

CW Photos by Edward J. Bride

Clark Weissman of System Development Corp. and Major Roger Schell of the Air Force's Electronic Systems Division discuss software security during panel session.

Schell also discounted the theory that erasing or writing over disk files protects the data formerly encoded on those files. At least in laboratory conditions, overwrites and erasures can be filtered, up to five levels, he reported.

The Air Force breaks and burns some packs, rather than ship them out for repairs, because of this danger, Schell said.

He was also critical of the "tiger team" approach of hiring a team of experts to try to find the holes in a secure system.

These experts could "find 2} holes, and somebody would declare the system secure," Schell noted. Somebody trying to break the system is "not thwarted by the number of holes covered" after the tiger team has finished its work, he said.

"Just the one left open" will be found and utilized, he warned.

Anderson agreed, noting a user cannot proofread software as he can literature.

The panel was an outgrowth of a workshop held earlier this year at Princeton, N.J., and was held in conjunction with the annual conference of the Association for Computing Machinery.

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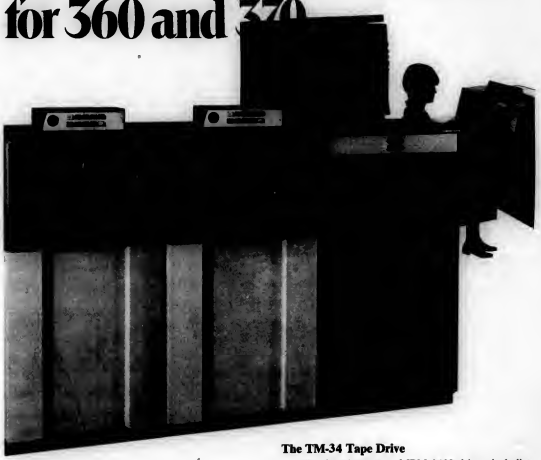

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Rap Sheet Exposure May Be Greater, Penalty Stiffer

(Continued from Page 1)

visa, security, law enforcement and employment purposes.

In the court case, the judge of the U.S. District Court for the District of Columbia had ruled that present regulations prohibited dissemination of files to anyone except federal agencies and state and local law enforcement organizations for law enforcement activities.

He objected especially to the incompleteness and non-current status of many rap sheets. He noted that they often listed arrests and indictments without giving current and up-to-date information on the disposition of such cases.

"After the decision, it was necessary for the FBI to curtail the service of providing such records – a service which it had undertaken in good faith for many years," according to Hruska.

"The curtailment affected many public and private institutions which had come to rely on receiving criminal record information for employment security or licensing purposes," he added.

At present, temporary legislation permits the FBI to continue this service to banks and state and local officials for licensing and employment purposes.

But the current legislation, which runs out next June, also prohibits the FBI from disclosing the records "unless such record discloses that such person pleaded guilty or *nolo contendere* to or was convicted of such charge or offense in a court of justice."

That interim provision was added to the bill proposed by the FBI by Sen. Sam J. Ervin (D-N.C.) who stated that "the dissemination of information, mere arrest, without any follow-up as to whether there was a conviction, has caused great difficulty to many Americans.

"I want . . . to make certain that if the FBI furnishes this information they have to furnish a record of what happened as a result of the arrest or the charge and show that the man either was convicted or pleaded guilty. I think everybody is entitled to that kind of protection," he said in debate on the interim measure.

Current Bill

The Hruska measure would not require that action on the part of the FBI, but would place the onus of making sure the records were up to date in the hands of the state or local agency.

Under the Hruska bill "agencies submitting criminal record information to the attorney general or his designee shall assure that the information is accurate and complete, and regularly and accurately revised to include subsequent information."

Failure to keep the records both up-to-date and accurate would make the local agency ineligible to receive any criminal history information under the bill.

But while the bill opens the door for the use of rap sheets by businesses and labor unions, where a need for such information has been shown, and by foreign governments, it also provides the stiffest penalties yet proposed by the Justice Department for misuse of the files.

Penalties Outlined

Under the act "a person with respect to whom criminal record information willfully has been disseminated or used in violation of this section shall have a civil cause of action against the person responsible for the violation and shall be entitled to recover from such person actual damages" and other costs.

In addition, the bill also provides for a $1,000 fine or a year imprisonment, or both, "for any one who willfully disseminates criminal record information knowing that such dissemination or use to be in violation of this section."

Hruska and critics of the proposed legislation agree that the most potential for danger in the bill lies in the section that permits the dissemination of rap sheets for non-law enforcement purposes.

"Concerning this category, however, there would have to be a prior determination by the attorney general that there is a need for the information to maintain or promote security within the requesting agency, or within a business, industry profession or labor organization fulfilling a vital public need to protect other vital public interests," Hruska said.

"It should be clear from this discussion that information will be denied to all agencies and employers except where they meet very strict statutory standards," he added.

"I believe," Hruska concluded, "that the bill sufficiently balances the competing interests of those who have a valid need for criminal record information and those individuals about whom the information pertains."

Several sources here, however, disputed the claim that the bill in its present state was the best balanced one possible.

"I don't think that we should allow the FBI to disseminate these files any further than they have in the past and feel that it would be dangerous to allow them to go to business and labor unions," one Senate staffer said.

"I can see the reasons for allowing state and local officials to have access for licensing purposes," he added, "but see no real need to allow private organizations to use the files to screen potential employees or for any other function."

Another Senate committee staff member said he favored the Ervin approach of allowing the FBI to only disseminate information on cases that have been closed with a plea of guilty or conviction in court.

"If they can only release information on cases that are completed, there will be much less chance for error or misleading information being disseminated," he said.

"But at the same time," he added, "this bill goes a long way to closing some of the loopholes that have been present in other regulations regarding the use of data from the rap sheet files.

"With a little tightening it should meet most of the objections to the use of rap sheets in FBI files," he concluded.

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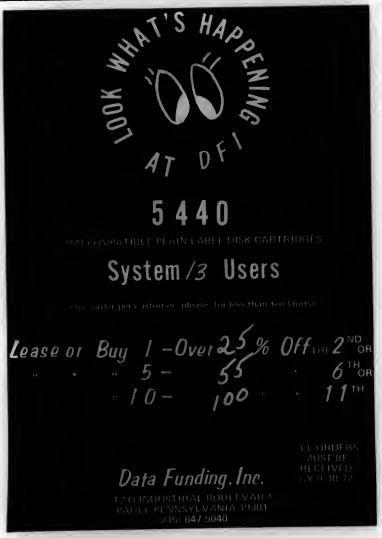

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SS Agency Finds DP Aid After Flood

BALTIMORE – The Social Security Administration has called upon five Internal Revenue Service computer centers to help clear up the backlog of work, when one of its centers was flooded by tropical storm Agnes.

During the storm the Wilkes-Barre, Pa., computer center suffered damage creating the backlog. Since the IRS centers have similar computer facilities, SSA asked them to help in the 20 million-plus document project.

The five centers involved in the project are in Ogden, Utah, Kansas City, Cincinnati, Memphis and Atlanta.

County Tracks Cheating Dads

MINNEAPOLIS – The Hennepin County Welfare Department has added a new tool to its eight-year-old computerized welfare system. Social Security numbers are helping locate divorced or separated fathers who have defaulted on child support payments.

In the basic system, a file in the IBM 360 is opened whenever someone applies for welfare or the court notifies the county that a legal separation or divorce has been obtained and child support payments have been ordered.

The file contains information including the amount of the payment, the frequency of payment and the father's SS number. Since payments are made directly to the welfare department, the file also keeps a record of receipt of payment.

Regular reports are printed out and sent to case counselors; when the report indicates a father has not been making payments his SS number is sent to the Social Security Administration which uses the wage and tax returns to locate the father and assess his ability to pay.

City Tackles Costing

MADISON, Wis. – The U.S. Department of Housing and Urban Development has awarded a $75,000 grant to aid this city's current effort to design a computerized management accounting system to detail exact cost of city services rendered and duties performed.

The cost analyses will then permit budget analysts to assign spending priorities to assist aldermen in budget sessions. Among the system's objectives are:

- Identification of costs by responsibility and relation to appropriate measures of output.
- Continuous reporting of actual costs compared with planned expenditures.
- Providing comparison data with other municipalities.
- Identifying potential budget overruns far enough in advance to plan alternative actions other than supplementary appropriations.

Do-It-Yourselfers Save

ALTOONA, Pa. – Self-service pumps and a computer have allowed car owners to save three cents per gallon by pumping their own gasoline at a station here.

A computer control inside the station allows the customer to pump his own gas, while recording the sale price. The control contains a switch which permits the serviceman to cut off the pumps if the customer has not followed the no smoking rule posted next to the pumps.

Since there is only self-service, the gas is three cents per gallon less than at the regular pumps. Ron Tragon, who operates the station, said the difference has been made up in volume. Since the two self-service pumps went into operation, volume has increased 15% to 20% at those two pumps, he said.

Kidney Recipients Matched

BUFFALO, N.Y. – A terminal at Roswell Park Memorial Institute here linked to a computer in Albany is playing a potentially life-saving role in kidney transplantation.

Stored in the computer, which also has terminals in other cities, are the blood and tissue factors of patients who need kidney transplants. There are more than 30 factors and the closer they are matched between donor and recipient, the greater the chance for a successful transplant.

Whenever a donor kidney becomes available, tests determine the blood and tissue factors. The results are fed into the computer which comes up with the name and physician of the patient whose blood and tissues the donor's kidney most closely matches.

FBI Finally Gets Its Cow Thief

DETROIT – A computer has caught up with Eddie Allen 32 years after his grandmother turned him in for stealing her cow.

Allen, now 50, and an employee of the Detroit Department of Sanitation for the past 20 years, was arrested and convicted for selling one of his grandmother's cows to a neighbor on a dirt farm in pre-World War II Alabama, but he escaped on the way to jail for his one-year sentence.

He remained free of the law until an FBI computer matched the fugitive Eddie Allen with the sanitation worker Eddie Allen.

Since his arrest, he has been free on $5,000 personal bond, pending an extradition decision.

News Wrapup

Heart Drug Made Safer

LOS ANGELES – A widely used heart drug with frequent adverse reactions has been made safer by a team of researchers and a computer at the University of Southern California (USC).

Digitalis, a drug used on many heart patients, can cause severe reactions – sometimes death – when given in incorrect dosages. In the past, doctors have had to rely on their own judgment to determine the correct dosage for an individual patient. As a result the incidence of adverse reactions was about 20% to 30%.

Dr. Roger W. Jelliffe, associate professor of medicine at USC, and USC mathematicians spent four years developing a computer program which can make a more precise determination.

The computer considers such factors as the patient's body weight, degree of kidney function (digitalis is eliminated from the body by the kidneys) and the interval between doses.

A controlled study of the computerized method showed incidence of adverse reactions dropped from 35% with the old method to 12% when the computer was used, Jelliffe said.

The USC team has begun usnig the program with other drugs with similar characteristics to Digitalis.

The programs are available for general use through arrangement with GE by means of a telephone hookup.

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Programmers, Supervisors Do Have Their Differences

By a CW Staff Writer

KENSINGTON, Md. – Programming supervisors are evenly divided on whether they should fire or retain programmers who refuse work on grounds of conscience, but programmers themselves strongly back the refusal of such work.

This issue is one of six in which programmers and their supervisors disagree on reasons for firing employees; 20 issues were included in a recent survey by the Association of Computer Programmers and Analysts (Acpa), with 81 members responding.

While supervisors were evenly divided on the conscience issue, programmers or non-managerial members were more than two-to-one behind the right of an employee to refuse work on grouods of conscience.

Other areas of disagreement included marginal work, theft of inexpensive supplies, adherence to working hours, disruption of others and the opinion of an individual that he could not do a good job on a certain assignment, Acpa noted.

Survey results are included in the current Acpa newsletter, *Thruput*.

Both programmers and supervisors overwhelmingly agreed that a manager is justified in firing a programmer or analyst who repeatedly violates security rules, even if no compromise of secret data has resulted.

In the area of minor theft, the supervisors were about evenly divided on whether to fire the employee, but the employees were about three-to-one in favor of retaining a person "caught taking inexpensive supplies for his personal use."

On marginal performance, managers were about four-to-three in favor of firing a worker who performs below the average – not poorly – while the employees were three-to-two in favor of retention.

The supervisors were about evenly divided on adherence to company working hours, with the programmers saying, by a vote of more than two-to-one, that no employee should not be fired for refusal to adhere if the individual works as hard and as well as anyone else.

Programmers disagreed with supervisors in the area of personal conduct on the job, with the employees voting to release a person considered by superiors or fellow workers to be "something of a disruptive influence." The supervisors were divided evenly on that item.

The supervisors were overwhelmingly in favor of firing an employee who refuses an assignment on the grounds that it would be a misuse of abilities, or that he could not, "in his own estimation, make a good job of it," Acpa noted. The employees were slightly in favor of keeping such an individual.

NCIC Output More 'Cautious'

WASHINGTON, D.C. – The use of special notations oo computer output from the National Crime Informatioo Center is proving its worth, the FBI has reported.

A "caution" statement may have saved the life of an officer in Auburn, Neb. after an NCIC check on a parked vehicle with a sleeping occupant.

The output was a "hit," indicating the occupant was likely to be a fugitive, presumably armed. The officer placed the man under arrest, without incident, even though the occupant was sleeping with a gun in his hand, hidden beneath his body.

In a separate statement, the FBI said notations on all "hits" remind users to check the entering agency to make sure an outstanding warrant is still in effect.

Police and. FBI procedures had been criticized because of an impression that mere existence of an NCIC record caused the dismissal of two municipal employees in New Orleans [CW, June 14, July 26].

An FBI report indicated that their employment was abruptly halted – two "budding careers" ended – after a demonstration of the terminal resulted in "hits." An FBI inspector said they were dismissed only after proper procedures were followed.

These procedures included checking the two warrants to make sure they were current, as well as other parts of the criminal justice process (return to prison for escaped individuals, trial and conviction, etc.) The "careers" were reported ended in an FBI newsletter which deals mostly with the NCIC itself, and not the entire process of justice.

The FBI has also reported that recovered stolen vehicles are now automatically reported to agencies which entered the data in any of 16 states.

Under the old procedures, a vehicle recovery would be reported to the FBI's data bank of stolen properties, but a separate communication would be required to inform the individual state police system which had input the item.

Now, there is automatic notification by NCIC when a recovery is reported in the following states: Pennsylvania, Illinois, Missouri, Washington, Oregon, Florida, Michigan, Texas, New Hampshire, California, Ohio, Delaware, Maryland, Minnesota, Virginia and North Carolina.

Amid the Quibbling Ex-GI Delayed Treatment From VA

PITTSBURGH – A "balky computer" is being blamed for delaying vital radiation treatments for an ex-GI with Hodgkins disease.

Douglas Diehl, who was discharged from the Army last May, is the victim, and the Veteran Administration has been charged with worsening his problem.

Local sources reported that Diehl has been assigned two separate claim numbers, one at Walter Reed Army Hospital earlier this year, and the second number when he applied for treatment after discharge.

A local newspaper said a "balky computer" issued the numbers, but a VA official said it was a human error.

The charge of delaying the vital treatment came from John Rohac, one of the founders of a Community Chest Veterans' Referral Service.

Rohac said Diehl's treatment has been delayed because the Army's computers thought there were two Douglas Diehls, and the two VA workers couldn't get all the ex-GI's records together.

The VA denied the claim, saying a discharged veteran can get necessary medical treatment, without all his records, within six months after discharge, and that any delays were unrelated to the duplicate numbers.

Attempts to reach Diehl were unsuccessful, and neither the VA nor the referral service knew whether he had been admitted to a hospital for treatment.

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Editorial

Rap Sheet Dissemination

Senate bill 3834 contains two safeguards against the misuse of FBI criminal history records. Individuals would have to be notified if their records were released to anyone other than a justice agency and they could ask to see and correct the record. The bill also provides for penalties for misuse.

What we don't like about the bill is that there is no limitation on the amount of information that can be released.

The law currently in force only allows disclosure of cases in which the defendant pleaded guilty, pleaded no contest or was convicted.

We don't think even the current limitation is enough. In an age when a person's entire past criminal history is available at the touch of a button, we don't think that non-justice agencies are entitled to information on dismissed charges or on convictions that are more then a certain number of years old if his record has remained clean.

'Isn't It About Time He Outgrew These Pants?'

Letters to the Editor

Getting 'New Skills' Means Fewer Jobless

Reference the Aug. 16 article on "DP Job Hiring on the Upswing".

We have been aware of very few programmers and analysts with "new skills" (third-generation systems programming, on-line, real-time applications, etc.) who remained unemployed for a period in excess of one month during the computer industry "depression."

Rather, those individuals who failed to keep their capabilities/skills current found themselves competing for the jobs in the diminishing sector of the industry.

The demand for computer professionals has so outstripped the supply that employers are now offering to upgrade skills of new employees (or stated differently, are flexible on their skills requirements for employement).

To the employed individual looking to move into a more significant work arena, this is more meaningful than statistics or government employment programs.

David Samuelson
President
Quest Systems Inc.
Washington, D.C.

Man Is Main Source Of DP Horror Stories

Alan Taylor's article on computer horror stories [CW, Aug. 9] raised some interesting points. His suggestion of hardware capability to notify the problem program that a card does or does not contain a verification mark seems a good one.

However, such a feature does not ensure that a verified card contains only valid data. Also, if the programmer failed to use the feature or used it incorrectly, then you are back to the original problem.

I do agree that such a feature should reduce the incidence of problems of this type which is good but it will never eliminate them.

I also agree with Taylor's suggestion that a "good" compiler should include a check for the presence of alpha data in a numeric field. I also doubt that it is practical, particularly on machines such as the 360/370 which include binary arithmetic capability.

The problem is that current Cobol, Fortran and PL/1 compilers include language features which allow the programmer to get around any checking the compiler might be able to generate, e.g., Equivalence, Redefines, Define, Based variables, etc.

Even if checking could be made available, the programmer should be given the capability of disabling it to eliminate the overhead which would be associated with it. Given that facility, if the programmer failed to enable checking when it really should be enabled, you again are back to the original problem.

The errors which Taylor describes are the result of human failures, e.g., the programmer, given the limitations of a particular computer, failed to thoroughly edit the input data.

While improvements to hardware and software will help, they simply will never eliminate human errors. Until better practices are developed and enforced for system design, program design and program testing, the main source of computer horror stories will continue to be the good old Mark 1 Human.

S.G. Miller
Manager, Computer Systems Div.
Standard Oil Co. of California
San Francisco, Calif.

Playing Better Chess

In my letter concerning chess [CW, Aug. 9] I did not wish to ask how well computers play chess, as W.B. Adams seems to assume [CW, Aug. 23], but to change the frame of reference from man vs. machine or machine vs. machine, which J.P. Gonnella refers to [CW, Aug. 23], to man *using* machine vs. man.

I am playing chess; it is my move, I think. I interrogate my computer via terminal, get the results, then think some more. Interrogate. Think. Then I move.

My question is, can programs be written to support the activity which will make me a substantially better chess player? (I think the answer is yes.)

Peter H. Huyck
Iowa City, Iowa

Tape War Long Over

Regarding Edward Burt's "Viewpoint" article [CW, Aug. 16] I believe that his "market vantage point" is not quite current. The tape pricing war he refers to has been over for some time, and tape prices have largely stabilized.

First, I strongly resent Burt's sweeping disparagement of tape distributors. Jersey Tab Card Corp. performed an important function in providing the overall marketing plan of the tape manufacturers by providing sales coverage and service to the smaller users, a function which is uneconomical for them to perform themselves.

Some of our salesmen have had more experience selling tape than most "direct" salesmen. Burt also disparages the tape manufacturers by assuming that they do not care about the level of competence of their distributor's salesmen.

We are currently distributors for 3M which has made every effort to ensure that our salesmen are knowledgeable in 3M products and kept current on users' requirements.

This brings me to the second aspect of my disagreement with Burt's conclusion – tape maintenance.

The market for tape maintenance equipment and services has never been better.

Due to technological advances and specialized marketing techniques, the cost of tape maintenance service has kept pace with the declining prices of tape.

No matter how you look at it, the cost of tape rehabilitation is still about half of the cost of a new reel of tape. Another important factor in the tape maintenance market is that in-house tape cleaners and evaluators are now economical even for relatively small libraries.

Most data processing managers now realize that no matter what quality tape they use, some kind of maintenance program is necessary in order to ensure high performance over a long-term period.

I do agree with Burt that tape should be purchased with the quality factor as a major criterion and not just on a price basis. The problem lies in the user's capability to test for quality on a regular basis. At present, only those installations with on-site evaluators can do this.

Once again, the large users have an advantage and the small user must depend on the reliability of the vendor to provide him with a consistently high-quality product and to stand behind it 100%.

Richard J. Williams
Vice-President
Jersey Tab Card Corp.
Union, N.J.

On Industry Unity

I read with interest S.P. Eglash's article on limiting IBM and unification of the DP industry generally [CW, Aug. 23].

While I am in general agreement with Eglash's comments regarding the utility concept, I believe he is oversimplifying the future of the leasing industry.

Randolph Computer Corp. feels that IBM's recent announcement of virtual capability greatly enhances both the utility and longevity of the 370 line and we are aggressively seeking 370 operating leases which offer our customers both savings and flexibility.

Recent announcements by our competitors in the leasing industry indicate they share our faith in the future of third-party leasing.

As to our 360 portfolio, demand for equipment remains strong, and we foresee for some time to come a healthy marketplace consisting of users attracted by the price/performance offered by the 360 in running applications which do not require the additional capabilities of the 370.

Michael R. Seekings
Director of Operations
Randolph Computer Corp.
Greenwich, Conn.

Beware the Beast

Re: Editorial cartoon of an octopus (proposEd uniQue Universal ID) [CW, Aug. 23].

The four arms of the beast (financial, harassment, dehumanization, government surveillance and saturation advertising) are nothing new to our society.

Today, my mail brought three separate third class blurbs for DP training seminars. This company mails to all DP people it can, in hopes of generating revenue. Saturation advertising? Yes.

Have you been in the Armed Forces? On a municipal police force, or other law enforcement agency, or a civil service employee? Government surveillance? Yes.

As we formed cities and specialized in trades or crafts, someone had to take on the job of looking out for others' interests. Now that we are nations, should arms such as the CIA be severed from the body politic?

Merely living in cities, and being thus at the mercy of others for their services is dehumanizing.

And as long as there's a profit motive, someone will set out upon a course to get the last dime possible from customers. Financial harassment? Yes.

None of these is dependent upon adoption of a "S.Q.U.I.D." to be present in our daily lives. The computer does not originate these four forces. It merely does what its programmers (humans, like you, me and other computers) have told it to do.

To reduce these four forces' influences, work with people. Machines (e.g., computers, traffic lights and all the rest) don't know you from Adam.

Neither will S.Q.U.I.D.

Ronald E. Roeder
Dallas, Texas

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

When Will IBM Release the Full 158/168 Information?

IBM recently announced two new systems, the 370/158 and 370/168. The systems existed at announcement. Apparently IBM was satisfied with its knowledge of the performance of the machines.

It was known, for instance, that the 158 would execute instructions 20% to 40% faster than the equivalent 155. The size of the improvement was a little bit curious, because the memory speed of the 158 was twice as fast as the speed of the 155, so clearly some other factor than memory speed was involved in the performance characteristics.

The Taylor Report
By
Alan Taylor, CDP

But users did not receive – and still have not received, so IBM tells me – "any other data. They must wait until next year for the benchmarks." Why?

The IBM timings were presumably produced by running programs on the systems, or else by theoretical methods. In any case they did not just appear from the new memory configurations. IBM must have had some more detail which it chose not to share with its customers.

Is this withholding of information fair when IBM is selling systems – and also therefore interfering with other manufacturers' salesmen offering other equipment?

"Why doesn't IBM release the details as to how the test programs worked, the readings, the performances, etc. and the programs themselves?"

In fact, IBM makes a practice of permitting the withholding of information from its customers and prospects. A standard method of publication by the corporation is what it calls the "Installation Newsletter." From its start in the midsixties these documents have gone to the IBM representative who determines whether to pass the data on.

(Today IBM even has a pseudo publication on green paper which appears to be the complete newsletter – separately paged and with its own table of contents. This can be shown to a customer – but it is not the complete "newsletter" it purports to be.)

To the users of a few years ago, it was perhaps unimportant that all the information about a machine's performance was promptly made available to them. They could decide for or against it on its vital specifications.

Sometimes they would want it benchmarked, often the specification by itself would give adequate information about its operations. In any event the manufacturer then really had little additional information.

Science Now Available

This situation is not true today. The performance figures put out by IBM are anything but obvious. The analysis necessary to understand these figures has become a science in the meantime. IBM's Systems Measurement service, although now withdrawn as far as users are concerned, is, I believe, still available to branch offices.

There is no reason to suspect that the engineering departments do not have even more sophisticated techniques available.

Why then is the data not given to the customers? IBM says the length of time involved in waiting for the benchmarks is "normal" for this type of equipment.

Perhaps it is, but there is no reason why the customer should not have the necessary information. There is no reason why the computer industry, including the leasing companies considering providing evaluations of 155s and 165s, should now have its cash flow projections scattered by lack of available information.

IBM has the information, why doesn't IBM let the user have it? Why doesn't IBM release the details as to how the programs worked, the readings, the performances, etc. – and the programs themselves?

If there is a range that goes from 10% to 30%, then some programs showed only 10% improvement, and others showed 30% improvement. Let us know which ones, and then we can make a better evaluation.

IBM's advertising has used the idea "isn't it nice to have all the information!" Yes, it is nice to have all the data . . . So, when will IBM let its users have what is available.?

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Here's the Real Truth About Computer Records

Recently I talked to many computer students aiming for business careers. They told me about ways of keeping records for their future employers. They talked about disks and tapes, sequential and random access and other items.

But they couldn't answer what the difference was between record keeping on computers and record keeping in the traditional noncomputerized manner!

They had, of course, many suggested answers. They told me about speed. They told me that the computer's records were in binary. They told me that computer record keeping was efficient. They told me that it was on a different type of media. They told me it was unseen by the human eye.

No Real Records!

But they never told me that computers don't *keep* the records! They simply had never realized that computers just copy and recopy data! Not one student – and not one faculty member (although not all of them were asked) – pointed out that computers don't keep anything – and that, in any case, what is on a computer file is not a real record!

Taylor Thoughts

Actual Definition

Yet this is the actual truth. The whole definition of a record – which can be found in a dictionary – is that it denotes the occurrence of something permanently. Copies of records are not called records – they are called copies of records. Records are valuable – but copies much less so.

If I choose, I can go to the State House in Boston and see some of the original charters that set up the Massachusetts Bay Colony. These charters are a record of what the king did.

By contrast if I look at a copy of a computer output which includes a quotation from a 19th century history book which says it gives an account of what the king did – that isn't a record. That is an assertion – even if it purports to give it in the original wording.

At most it's a copy. It may be a good one or it may be a faulty one. But it just isn't a record. And neither are the contents of the data sets on your files!

Problems Unrealized

It is rather disquieting to think that some people are entering information processing without realizing the problems in the simulated record keeping used in computers. Naturally, therefore, neither do the persons realize what the uninformed user will expect it to be!

Users expect records to stay the same. Computer people hope they will, but know computer records may not.

Users will expect a person to be able to look up the previous records and prove a record item quickly – computer people are quite prepared to assume that in order to do this people will be happy to track through day-by-day records to find any changes, or to search laboriously through reams of indistinct microfilm – as the credit card people have found to their horror.

Moreover, users are going to be misled into continuing this type of thinking if the very people we are training for the profession have not realized the difference – and therefore learned what precautions must be taken to assure accuracy to the maximum, or what responsibility must be taken by the user to insure that the result – with its basic destruction of most real records – is acceptable to him.

Accuracy Unimportant

I think this is important. You may think it is perhaps a small matter. A letter appeared recently [CW, Aug. 23] which suggested in the case of the Blue Cross-Blue Shield accounts that it was strange that I did not recognize that Framingham ORT was the Framingham Orthopedic Association.

Framingham ORT was being described on a computer document as a "Reporting Doctor." The Framingham Orthopedic Association is not a reporting doctor. The document was inaccurate.

When data processors proceed to make excuses for inaccurate descriptions or when they proceed to conceal the fact that computers don't keep records, they are leaving themselves wide open to being misunderstood – and to keeping our profession in the dirt.

Surely the items that are to the credit side of computers are sufficiently worthwhile that we can afford to let the public and our students know the truth.

Surely, information processors, of all people, should care about the accuracy which is synonymous with the word information. After all, if our data is not accurate, then what we give is not information but poison.

It is not our professional function to tolerate the poisoning of our information sources. Let us face the truth!

How the Installation Newsletter Works

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These details about the dissemination of the information included in the Installation Newsletter – which can be very important to users – indicate that the representative is authorized to discriminate between the information service that IBM provides for installations.

The Installation Newsletter may have contained more information about the 370 performance than is indicated in the article but to get it an installation must take care to stay on the "right side" of its IBM representatives.

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Discuss System Properties Before Compatibility

By Tom Gilb
Special to Computerworld

Re: Ferguson on S/3, "Compatibility Must First Be Defined" (CW, Aug. 2).

I strongly agree with the headline, in fact, not only do we need definitions for "compatibility" but we desperately need them for a large number of similar economically and practically important areas of systems properties.

Not only do we need adequate definitions, we need measuring concepts so that we can more accurately work with the "varying shades of grey" which characterize the "real world," and not be forced, as Ferguson says ("One computer is either compatible with another or it isn't – there is no in between."), to discuss important issues in hopelessly inadequate terms.

Property of Systems

To discuss compatibility, I believe we must first discuss the property of systems (such as computer program sets) called Portability (P_s), which is a measure of the "recoverable system investment" after moving a system from a "resident environment" to a new "target environment (E_t and E_t). P_s = 1 - (conversion cost/ original cost) in simplified terms.

This is clearly a simple and practical economic concept for software and systems. I have already been able to use it in

Viewpoint

software contracts and design specifications.

Now, portability is a property of a single system (s) in relation to two sets of environments (E & E). Compatibility on the other hand, is a description of the Relationship Between Two Sets of Environments (E_r and E_t).

In Ferguson's terms "s" is a random set of 1,000 RPG-11 programs. E_r = IBM S/3 and E_t = Burroughs 1700, both with 96-column cards.

The portability (P_s) of all these conversions (P_{s1} = .999, P_{s2} = .986, etc.) can be of the (average) compatibility between E_r and E_t in terms which a DP manager can use to make decisions.

We may conclude that for the type of system described (RPG-11), the expected compatibility of the environments (S/3, 96 column and B1700, 96 column) is 998 (or 99.8%).

We might give the lowest and highest measured values (P_{s33} = .901 and P_{s234} = .9988) or other measures of "worst case/spread," and we might even show how the values vary for interesting changes in the environment definition (configuration or software level) or the type of system (very large programs as opposed to trivial programs, for example).

Ideally we should be able to build up tables of such data for all important environments and system types.

Future Costs

This would warn system engineers and DP managers about the expected future level of conversion costs and effort for a given present strategy of environment selection and system design (i.e. the old question of which programming language to use or which configuration gives the best compatibility).

Other immediate consequences would lie in the area of backup system consideration and "open-market" software design engineering.

I strongly believe this type of thinking (quantitative, in "degrees") about the central qualities of DP systems, which we thus far have largely let go unmeasured, is going to be a major step forward for DP education, management and design engineering.

The tool of datametrics is, after all, nothing more than the application of quantitative concepts to an engineering/ management area of substantial economic importance. This is something which all successful engineering/management fields have had to develop.

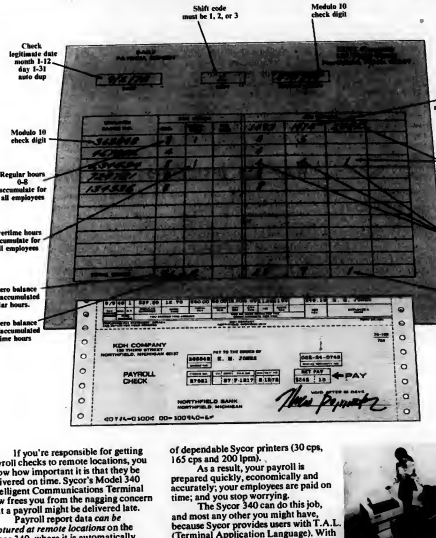
It is about time that DP professionals feel ashamed to work with a lesser tool any more.

Ferguson's Group/3 can take practical steps forward by measuring (from accounting procedures) costs (in terms of present value) of original system development (RPG II programming and debugging alone for example), and the cost of conversion effort (in money or manpower time).

It should pool its data and publish it for the benefit of all the members who must make present and future decisions which will affect their conversion costs, be it to other S/3 software, B1700, IBM 370 or entirely foreign systems. (P_s tends toward zero or negative values; conversion cost exceeds cost to make new system.

Gilb is an EDP consultant specializing in computer selection, contracts and personnel selection in Norway.

REMOTE PAYROLL ENTRY AND CHECK-PRINTING FROM SYCOR.



If you're responsible for getting payroll checks to remote locations, you know how important it is that they be delivered on time. Sycor's Model 340 intelligent Communications Terminal now frees you from the nagging concern that a payroll might be delivered late.

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LEAA Head Predicts Crime Rate Decrease

NEW ORLEANS – The U.S. in 1972 "will experience an actual reduction in its crime rate," according to Jerris Leonard, administrator of the Law Enforcement Assistance Administration (LEAA).

Leonard praised individual states, particularly members of the National Association for State Information Systems (Nasis), for assisting in the fight against crime through computers and information systems.

He made his remarks during a luncheon speech at the annual Nasis conference.

Auto Crashes Routine

COWLEY, England – While automobile crashes sometimes are catastrophies, they are routine to a special computer-controlled data acquisition system being used in an experimental safety vehicle program at British Leyland Motors Corp.

The prime objective of the program is to help develop an energy-absorbing front-end auto structure that will ensure greater occupant safety.

As part of the System 80 designed by Computer Instrumentation, Ltd., a Computer Automation Inc. Alpha 16 minicomputer will monitor data recorded by analog devices, called accelerometers, worn by dummy occupants during the critical period of the crash.

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SOFTWARE&SERVICES

Random Notes

'Time' Uses 10K of Core To Develop, Control CAI

ST. LOUIS, Mo. – A computer-assisted instruction (CAI) software package available now from McDonnell Douglas Automation, called "Time," teaches employees new skills up to 60% faster than any other current technique, a spokesman claimed.

The system can be used on "any" computer with 10K bytes of available core. It supports multiple concurrent trainees, each working at his own pace at a CRT terminal. Lessons are written in conversational English; and can be geared to each trainee's learning speed.

The software is available for $49,000 on a permanent license from the vendor.

IMSL Extends, Updates Library Of Fortran Routines for 360/370

RACINE, Wis. – More than 250 subroutines written in Fortran are included in the second edition of *Library 1* now available for IBM 360/370 users, from International Mathematical & Statistical Libraries Inc. (IMSL).

Edition two contains 64 new subroutines including a new chapter on forecasting. The library is distributed in source code so that users can modify or combine the routines as they wish. Annual subscription rate is $840, from IMSL at 3801 Lighthouse Drive, 53402.

Service Watches User Inventory

CLEVELAND, Ohio – An inventory control system that keeps track of demand by month, accumulates year-to-date totals by type of transaction, and posts the dates of significant events, is available as a service or as a package for in-house equipment from Computrac Inc.

The programs produce four basic reports, the company said. These include an "action" report that flags situations requiring management attention; a manual inventory report on which the user records inventory transactions; an order report; and a management report. Computrac is at 4187 Pearl Road, 44109.

Varian Adds I/O Software

IRVINE, Calif. – Varian Data Machines has announced a new I/O package which operates under the Basic Executive Scheduler and Timekeeper (Best) real-time monitor for the 620 line of minicomputers.

The new software is said to provide automatic queuing of I/O requests and simplified access to peripherals through macro commands. It also provides what Varian calls "an important level" of support for process control.

I/O operations resulting from the macro commands are queued and controlled by means of control blocks in the user's tasks.

French Developer Says

'Laws' Stop Program Logic Omissions

By Don Leavitt
Of the CW Staff

WELLESLEY, Mass. – A highly disciplined system for developing program logic, said to protect the user against omitting any important part of an application, has been devised in Europe by J.D. Warnier of Honeywell Bull. This system is being studied for possible introduction in this country.

The Laws for Construction of Programs (LCP) is an application of the set theory to program design, Warnier explained. It imposes no restraints on the user's choice of programming language, files structure, or even CPU.

Once the LCP diagram is complete, the user codes directly from it, in whatever language is appropriate to his installation.

Nested Sets

In organizing programs under LCP an attempt must be made to arrange the operational steps in nested sets, starting with the whole and working down towards the necessary detail by successive breakdowns.

This means, Warnier said, that within each set a programmer always knows where he starts and where he is going. In contrast, conventional flowcharting is open-ended, with the programmer working symbol by symbol from a specified position to an unspecified one.

Normally the LCP "coding" structure takes on the appearance of a family tree or sports competition as it fans out into finer and finer detail from the origin.

Ultimately, each step can be shown to occur once at its unique appropriate place in the whole system, Honeywell said.

The only variation on the "occur once" rule applies to those steps which are alternatives. In that case, the LCP diagram would still apply, showing that one of the choices would occur "0 or 1 time" while the other would take place "1 or 0" times. Thus the choice is clearcut, according to the LCP advocates.

Such a hard-line approach prevents any omission, they say. Every originally vague step has to be carried out to the point that a definable programming operation is required, and is needed once.

Critics of LCP argue, however, that its rigidity also prevents any easy modification of the program logic and the diagram as the project develops.

Physically it is extremely difficult to add a new line of logic after the diagram has been completed, they say, whereas flowcharting permits expansion of a chart onto another sheet without disturbing the original symbols.

An LCP diagram shows the sequence of operations and the single or alternative steps needed to complete the objective of each logical set within a program.

Cross-Application Account Links Shown by 'Off-Line CIF' System

CHICAGO – DOS/360 installations with multiple, separate application files are able to review cross-application account relationships easily and without disturbing the basic files using the Off-Line Customer Information File (OFCIF) software from the Weiland Computer Group Inc. (WCG).

Developed for banks, the package can be applied in various other situations in which "snapshots" of multiple files would be useful.

Measuring the effectiveness of an advertising campaign aimed at one part of a customer base, or evaluating a proposed branch location in light of customer activity, are two such uses, WCG suggested.

The package can also be used to identify otherwise hidden duplicate or obsolete file entries so that they can be purged during the user's normal file maintenance procedures, a spokesman said.

The package can be used to selectively analyze any combination of up to eight individual application files. OFCIF generates and sorts an 11-character alpha key from these files, based on user-defined interests.

The software carries names, addresses and any other desired data to a work file from which it prints up to two lines of customer related account information and mailers, by account in alpha-key sequence, by bank (or corporate division) or by zip code, for any option selected.

The data extracted for printout may be changed with each running of OFCIF, and a statistical report of balance totals, account activity and relative percentiles support the selected option, the company said.

User application files must be converted to OFCIF-compatible format before the system can locate the data on which the alpha-key is generated.

OFCIF is written in BAL, requires a 32K system and is available for purchase at $2,000. WCG is at 330 S. Wells Street, 60606.

'Anxpack' Cuts File Sizes 25%

PITTSBURGH – The Anxpack subroutine package, now available from Compdata Services, allows the IBM 360 user to condense and expend alphabetic, numeric and special characters, data fields and complete records on a selective basis.

With the Anxpack method, files may be 25% smaller than unprocessed files, the company said, and the space saved might be used to insert new fields on records, or to add new records to a file, without surpassing the physical limits of the storage media.

The condensed data can be stored on magnetic tapes or disks, or on 80-column punched cards, Compdata said.

As an apparently unintended byproduct, the condensed form of files – regardless of the media – appear to provide a degree of protection against unauthorized access to sensitive data. The condensation goes beyond 360-style PACKing and is effectively unreadable without the corresponding Expansion routine.

Some condensing and expanding routines from other vendors are part of a user's I/O instructions and every record has to be massaged both going out to storage and coming into the processor for handling. Anxpack, on the other hand, is used by the programmer when he deems it appropriate.

The Anxpack module, written in Assembler language, can be executed from any application program, in Cobol, BAL, PL/1 or other language, through a standard operating system call. It will condense, or expand up to 136 characters in one operation, Compdata said.

The object code, for both "packing" and "unpacking," takes less than 3K bytes of core, and the entire module sell for $175, including a two-year guarantee. Compdata Services is at 530 Sixth Avenue, 15219.

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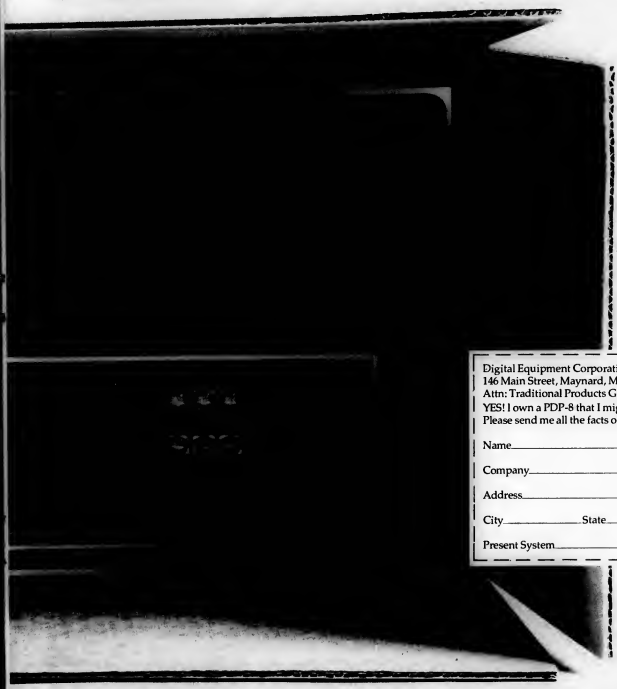

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COMMUNICATIONS

Data Briefs

CRT Has Cursor Read For CPU Interaction

ANAHEIM, Calif. – A CRT terminal that can transmit its cursor location on the screen to a CPU has been introduced by Lear Siegler Inc. Called the 7700A it has a screen capacity of 2,000 characters.

The "cursor read" capability allows a CPU to interact with the terminal via a data link without association of an operator, the company said.

The 7700A provides the operator with a blink feature and has cursor and editing controls. The all-LSI terminal is priced at $2,995, and is available in 30 days from 714 N. Brookhurst St., 92803.

4,800 Bit/Sec Modem Has MOS

CANOGA PARK, Calif. – A low cost adaptively-equalized, full-duplex 4,800 bit/sec MOS modem has been announced by American Data Systems.

Designated the ADS-448/IV, the modem operates over unconditioned or conditioned voice-grade phone lines. Designed for 4,800 bit/sec transmissions, the unit can be switched to 2,400 bit/sec when errors occur.

The unit features two-channel multiplexing, three loopback test modes and is compatible with EIA RS-232-C and CCITT standards. Light emitting diodes provide visual displays of line conditions, control and data transmission status. The modem costs $3,450 and is available in 60 days. American Data Systems is at 8851 Mason Ave., 91306.

Auto Call Combined With Modem

LIVINGSTON, N.J. – G-V Controls Division of Sola Basic Industries has a computer driven automatic calling unit/ modem combination.

Known as Model 907801-24 for pulse output and 907801-34 for the Touch-Tone version, the unit provides all of the features of Bell 801A and 801C equivalents but includes a Bell 103-type modem as an integral part of the unit. The modem is capable of data transmission up to 300 bit/sec on dial-up lines.

Prices range from $920 to $1,400 depending upon model, and availability is 60 days from 101 Okner Parkway, 07039.

Codex Adds Loopback

NEWTON, Mass. – Codex has added an unattended remote loopback option to its line of high speed data modems.

The feature allows complete systems testing and diagnostics even when a data system is unmanned at a remote site.

Alternate equipment, standby private lines, or remote alarms may be activated and connected through use of the remote switching capability. The option is available on the Codex 9600, 7200, and 4800 data modems for $750. Delivery is 30 days, from 15 Riverdale Ave., 02195.

Via CCap Program

S/7 Becomes Front End

By Ronald A. Frank
Of the CW Staff

WHITE PLAINS, N.Y. – IBM has added a message switching control program for the System/7 that can transform the small CPU into a store and forward front end for a 360 or 370.

Called the Communications Control Application Program, the software can accommodate various terminals operating with different codes in the same network. Written in S/7 assembler language with extended mnemonics, CCap/7 can poll and address each terminal in a network, and forward messages only when the terminal lines are ready.

The communications program allows the S/7 to act as a switching center to maintain control of data traffic rather than allowing remote terminals to control a communications network, IBM said. This concentration of control can avoid loss and duplication of messages, according to the company.

The CCap/7 program minimizes contention among terminals, provides automatic polling and answer capabilities, and will enable the S/7 to detect and retry incoming calls during temporary line and terminal errors.

To implement CCap/7 on an installed system, a user works at the S/7 5028 operator's console. A system generation program prompts the user with a specific series of questions concerning the communications network.

Included would be data on the number of lines, the number of terminals, their locations, phone numbers, etc. As the user types in his answers, the CCap/7 program automatically builds the message control system tailored to the network's needs, IBM said. In a typical S/7 installation this operation will take about an hour, according to the company.

To run the CCap/7 program, users must have a system with a minimum of 10K words of main storage and 4.88M bytes of disk storage. This would be a basic system for a network of 10 remote terminals and three half duplex lines, IBM estimated.

The communications program can operate with IBM 1052, 2740, and 2770 terminal systems and can support transmissions up to 9,600 bit/sec. It is scheduled to be available in March, 1973 for $200/mo.

Card Reader Transmits Data From Cards in Fortran Blocks

WAYNE, N.J. – Omega Data Processing has introduced a card reader that transmits only the data punched instead of the full 80 columns.

Called the Model 100, the reader can transmit at 110 or 1,200 bit/sec in full or half duplex mode. It can handle code conversion from Hollerith to eight-bit Ascii and is plug compatible with RS 232C devices having either even, odd or no parity according to the company.

The Model 100 is designed to operate with time-sharing systems with programmable codes to provide control characters to the CPU. Three modes of operation are available to transmit a maximum of 72 characters; the same number on a first request from the CPU and an additional eight characters on a second request; or transmission of the full 80 characters.

Fortran Users

The 72-character limit was chosen for Fortran users whose input data often is limited to that number, a spokesman said.

The card reader can operate in an auto mode under operator control or it can operate in demand mode when polled by the CPU. Remote shutdown of the unit under CPU control is standard. The device will also turn off when the input hopper is empty, output stacker is full, and mechanical malfunctions occur.

The reader is priced at $2,875 with first deliveries scheduled for October. Omega is at 180 Valley Rd., 07470.

Canada Report Favors More TP

OTTAWA, Canada – Business organizations should be permitted to interconnect data communications equipment to the Canadian telecommunications network, "subject to review" by regulatory bodies. This is one of the recommendations contained in a report released recently by the Canadian Computer Communications Task Force.

Commercial data processing organizations should be free to provide services so long as they refrain from anticompetitive practices, the report said.

In a related area, it recommended that the regulated Canadian telecommunications carriers offer "public data processing services" through separate unregulated affiliates.

Business organizations should also be free to "share and sub-lease rented carrier facilities for data transmission" subject to review by regulatory bodies, the report said.

The widespread use of data networks for remote access to computer operations "has not yet materialized" because of prevailing communications rates and limitations in available services, the report said.

Universities should not be allowed to take advantage of their "privileged position" of being tax-exempt and having other benefits to offer data processing services to outside users, the Task Force said.

'Indispensible Tool'

Computer/communications have the social significance "to reach into the lives of every individual" and remote access to computers is now an "indispensable tool" in the operation and administration of large and medium scale business, the report said.

The Task Force report was issued to recommend future policy to the government and it does not "necessarily reflect government or Department of Communications thinking," according to Robert Stanbury, Minister of Communications. Interested parties will have two months to comment on the report, Stanbury said.

Tag Organization Aids IBM TP Users

STAMFORD, Conn. – For IBM users who operate in a teleprocessing environment, membership in the Telecomputer Applications Group (Tag) can provide valuable information.

Formed about five years ago by IBM users entering data communications, Tag now has about 65 members some of whom are using independent front ends or other equipment along with their IBM mainframe.

An indication of the importance which IBM attaches to the group is the special liaison which has been assigned to interface between Tag and the company.

In addition to arranging for IBM speakers at Tag meetings, the IBM contact also provides important technical information to members, according to a Tag spokesman.

The user group meets three times per year and several sessions have taken place at the IBM teleprocessing development center in Raleigh, N.C.

Tag meets in February, June, and October. The next meeting is scheduled for October 3-4 in Pittsburgh. Membership in the organization is described as being "informal" and the only costs are those required to defray operating expenses. And small users are welcome to attend meetings, a spokesman said.

Information concerning the activities of Tag is available from the current chairman of the four-man executive committee, Edward Wilkins. Interested users can get additional details from Wilkins at Olin Corp., 120 Long Ridge Rd., 06904.

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SYSTEMS&PERIPHERALS

Bits & Pieces

Digital Cassette Handles PDP-8, Other Minis

SAN DIEGO – The Minicette 2000 Digital Cassette System from Cipher Data Products, Inc. can be interfaced to the PDP-8 series of minicomputers. Interfaces for both positive and negative bus machines are available.

The complete package includes from one to four cassettes, the interface, I/O drivers and diagnostic software. Features of the Minicette 2000 include read after write checking, CRCC check characters and dual threshold recording.

The system has a file read speed of 24 in./sec, and ranges in price from $3,425 to $6,625.

Interfaces for other minis are also available from Cipher Data Products at 7655 Convoy Court, 92111.

Datapoint 2200 Has Card Reader

SAN ANTONIO, Texas – Computer Terminal Corp. has added a 600 card/min reader to the family of peripherals available with the Datapoint 2200 Business Computer System. The reader may be used with the 2200 as either an independent system or for remote job input to a larger central system.

The unit reads standard 80-column cards and is attached directly to the I/O bus of the Datapoint 2200 through an interface adapter. Control is provided by the internal computer.

The reader can be leased for $110/mo or purchased for $5,600 from 9725 Datapoint Dr., 78284.

Guide Spots 360 Cable Assemblies

SKOKIE, Ill. – A computer cable guide for the IBM 360 from Anixter Communications Systems identifies the cable assemblies needed to connect all the various units of the 360 system.

The visual reference chart uses a simple numbering system for cable assembly identification between units, the firm said. The guide cites the functions of the various cables and includes photos of typical assemblies. Information on peripherals and special cable assemblies is also given.

The guide is free from Anixter at 5439 W. Fargo, 60076.

Disk Cartridge Has 2.4M Bytes

TORRANCE, Calif. – The Athana Division of Computer Disc Mastertape Corp. has a disk cartridge for the IBM System/3 5444 disk storage drive.

The capacity of the cartridge is 2.46M bytes.

Each byte in the disk is pretested track by track for error-free use by the customer, the firm said. The cartridge costs $145 from Athana at 1815 Mullin Ave., 90501.

Four Phase System IV/70

32-Terminal Configuration

Cluster CRTs Expanded

CUPERTINO, Calif. – Four Phase Systems Inc. has expanded the capabilities of its clustered CRT system, added a 2319 double-density disk and introduced software.

The 360/370-compatible IV/70 System is designed to appeal to users as replacements for the IBM 2260 and 3270 CRTs; as a stand-alone data entry system; and as a Cobol disk-oriented intelligent terminal.

The system can now handle up to 32 display terminals compared with a previous limit of eight. The IV/70 display terminal in a 32-CRT configuration can save the user about 60% when compared with four IBM 2848/2260 systems of the same capacity, Four Phase said.

In addition to the cost savings for the same amount of terminals, the IV/70 can display 1,152 characters, compared with 960 characters on the 2260.

The IV/70 has a 50M-byte double-density disk with a disk operating system, a 600 card/min reader, synchronous communications controller and a 1,920-character CRT with dual-intensity display feature that can perform many of the functions of the IBM 3270 terminal.

The all-LSI CPU included in the IV/70 has a maximum capacity of 98K bytes and uses 2,048-bit circuit chips for mainframe storage. The CPU is included on one circuit board.

Expanded Software

For data entry and remote job entry applications, Four Phase added expanded software to eliminate the need for a 360 edit run by performing editing and validation within the IV/70 system. Up to 15 program formats per job and 24 balance accumulators can be supported, the firm said.

Output data can be transferred directly to a 360/370 via bisynchronous communications or a local channel adapter. And data files can be processed in local mode using a Cobol compiler for report generation and applications processing, the firm said.

The Cobol software is an implementation of extended ANS Cobol that allows the user to accept character data from terminal keyboards for display without interrupting Cobol background processing, the company said.

A typical IV/70 system with four 1,920-character CRTs, a 72K byte CPU, disk, printer and bisynchronous communications capability will cost about $2,000/mo on a three-year lease. First volume deliveries of the system are expected in November, the company said.

Reverse Character Print Train Improves 1403, 3211 Operations

By Ronald A. Frank
Of the CW Staff

EDISON, N.J. – A printing technique that may allow users of IBM 1403 and 3211 printers to greatly improve certain operations has been developed by Reob Associates.

The technique is based on the generation of reverse image characters printed with "spot carbons" to produce readable characters.

Check Printing

In applications such as check printing and utility statements, a double print run, or an additional post-printing operation of envelope addressing and/or bill insertion, is usually required, according to a Reob spokesman. But with the addition of reverse printing characters on standard IBM print trains, throughput can be increased.

Using the Reob method, 23 reverse characters are added to a conventional 1403 or 3211 print train. Only 23 are required since 14 letters and numbers are symmetrical and require no changes in mirror image form, a spokesman said.

Routine Usage

Each reverse printing character has an Ebcdic code assignment which makes usage with Cobol and other languages routine, Reob said. While the cost of 1403 and 3211 print trains is increased by the addition of the reverse characters, the increase in throughput is more significant, the firm noted.

In a continuous check-printing operation which includes addressing and insertion machines, a rate of 2,000/hr is about normal, according to a spokesman. But with the reverse characters doing the addressing, this rate can jump as high as 12,000/hr, he said.

To achieve this type of throughput, the user can utilize folder-laminators such as the Moore Business Forms, Model 812 which seals the edges of the folded check and statement in on each other while the reverse image address (now appearing "right side up") is visible for mailing or other in-house distribution purposes.

In addition to the cost savings, the Reob method can reduce the time required to process statements by eliminating the conventional window envelope. By using the fold and seal lamination method, poor envelope seals, double stuffing, jams, and other mechanical problems are eliminated, Reob said.

Sealed Immediately

The reverse printing process also allows sensitive printed copy to be sealed immediately without resorting to manual procedures which could compromise the contents of the data, a spokesman said.

The mirror image characters are available from Reob which has a patent pending on the process. They are supplied to Reob under contract by IBM.

The 1416 print train for the 1403 costs $176/mo on a rental while the 3216 train for the 3216 costs $576/mo. Conventional trains from IBM, without the reverse characters, cost about $177/mo and $384/mo, a Reob spokesman estimated. Delivery of the trains is about six months from Reob Associates, 73 Oliver Ave., 08817.

Device Ties 620s to CDC CPUs

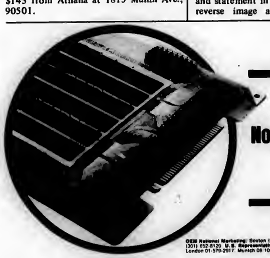
SOUTH PASADENA, Calif. – Users of CDC 3000, 6000 and 7000 series mainframes can enjoy significant savings by using Varian 620 minicomputers as front ends to their CPUs. The addition of the Model 2300 interface adapter from Sierra Data Systems Inc. makes the minis compatible with the CDC systems.

The Model 2300 provides a bidirectional data link to the CDC systems and can be installed on all models in the Varian 620 line, the company said. The adapter is installed between the CDC data channel converter Model 6681 and the E-bus or direct memory access channel on the Varian mini.

Minimal software changes are required in the CDC system and the only addition required by the user is an I/O driver routine, a Sierra spokesman said.

The interface adapter includes necessary hardware, cabling and a control/maintenance panel. It is designed for use in such applications as data acquisition, graphics, interactive control and telecommunications, the company said.

The 2300 costs $7,300 including installation. Compared with the cost of a CDC front-end system, a user with a 24-terminal network could save up to 50% by using the 2300 adapter and the Varian 620, a Sierra spokesman estimated. The front-end adapter is available from 305 Pasadena Ave., 91030.



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Business Guide Urges Users to Consider 'Less Flexible' Hardware Approaches

PHILADELPHIA – Small business computers can be expected to drop in price by as much as 30% over the next five years, according to a report by Auerbach Publishers here.

Before deciding on a small computer system, however, the user should consider other hardware approaches, the company warned.

For example, the "less flexible DP systems, such as electronic accounting machines and punched card tabulators" could satisfy the needs of some potential users at a lower cost than a computer.

Auerbach cautioned users to break in slowly when converting from manual or electronic accounting methods to small computers, with about a year of self education suggested for the conversion period.

The report, plus several user surveys and systems specifications is contained in the *Auerbach Guide to Small Business Computers*, addressed to small businessmen, who are taking a first look at computers, trying to relate system capabilities to their actual needs.

The revolution in electronic technology that has so sharply reduced the cost of computers in recent years and lowered price/performance ratios has also impacted the "smallest and least costly computers," the guide said.

Besides predicting price cuts, the guide includes general criteria for choosing between in-house and service computing facilities (including time-sharing), plus selection charts and descriptions of small systems made by 14 manufacturers.

The Small Systems User

The guide does not contain any information on the new Burroughs 1700 Series, despite the fact that the B-1712 is considered by many people to be the chief alternative to IBM's S/3.

An Auerbach spokesman said the 139-page book was compiled before the 1700 Series was introduced, adding there will be no automatic updates. Most of the systems, including the B-1700s, have been or will be reviewed in *the Auerbach Computer Technology Reports*, the spokesman also said.

Self-Education

The self education for the conversion "need not precede the use of data processing," according to the guide; "in fact, most of it can be acquired through gradual 'hands-on' practice."

The gradual break-in would come through about six months with a service outfit and some "in-house practice with a time-sharing system," the guide suggested.

This approach permits the user to acquire some basic skills in DP, as well as providing a "realistic test of the need" for in-house computing, the report continued.

In the final analysis, the need for more than 50 hr/mo of connect time in a time-sharing system indicates that a user should consider his own in-house system.

Among the Auerbach observations that might interest potential small system users is the fact that 96% of these systems (currently installed) have been made by five mainframe makers – IBM, Honeywell, Burroughs, NCR and Univac.

Dedicated minicomputers are not generally considered in the category of small business systems, and Digital Equipment Corp. and Data General have both been excluded for this reason.

Even so, an industry overview acknowledges that minis made by these two manufacturers are used as the heart of small systems made by other vendors.

As in the larger mainframe area, there is no ideal small system with the lowest price/performance ratio for a particular application.

The problem, the guide noted, is "how does one find which computers can do the job for the least overall cost?" Defining the type of jobs first, and then the budget, and then matching a system to the criteria, is the proper course, the guide noted.

The guide has several charts and illustrations, plus a glossary and directory of vendors, all in fairly general language for an entry-level computer user.

The guide is available for $19.95 from 121 North Broad St., 19107.

Homes 'Data Banked' in S/3

ROCHESTER, N.Y. – O'Brien Homes here, a real estate firm, has installed a small computer programmed by President Dave O'Brien, to survey client preferences, and retrieve stored characteristics of individual dwellings.

The IBM System/3 also does the payroll for the firm's 65 employees, and provides "timely management information" for the growing company, O'Brien commented.

Since the computer saves time compared with manual records, it helps control costs, ultimately benefiting the homebuyer, he added.

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IBM SYSTEM TYPE	TELEX SYSTEM TYPE	IBM* RENTAL	352 HRS. OVERTIME	TOTAL IBM MONTHLY RENT	TOTAL** TELEX MONTHLY RENT	TELEX MONTHLY SAVINGS	TELEX ANNUAL SAVINGS	% SAVINGS
370-135 3135 GF with 6-3420-5 tapes, 6-3330 disk and 2-140361 printers and appropriate controllers or adaptors	370-135 3135 GF with 6-8420-5 tapes, 6-6316 disks, 2-5403 printers and appropriate controllers	$ 20,551	1,600	$ 22,237	$ 16,369	$ 5,868	$ 70,416	26%
370-145 3145 I with 8-3420-5 tapes, 8-3330 disks, 2-140361 printers and appropriate controllers or adaptors and memory	370-145 3145 I with 256K Telex memory, 8-8420-5 tapes, 8-6316 disks, 2-5403 printers and appropriate controllers	34,334	4,318	38,652	26,846	11,806	141,672	31%
370-158 3158 J with 16-3420-5 tapes, 24-3330 disks, 2-140361 printers and appropriate controllers and adapters and memory	370-155 3155 J with Telex memory, 16-8420-5 tapes, 24-6316 disks, 2-5403 printers and appropriate controllers	94,642	7,270	72,212	50,462	21,720	260,640	30%
370-168 3168 K with 16-3420-5 tapes, 24-3330 disks, 2-140361 printers and appropriate controllers, adapters and memory	370-165 3165 K with Telex memory, 16-8420-5 tapes, 24-6316 disks, 2-5403 printers and appropriate controllers	108,982	18,018	124,700	92,278	32,422	388,864	26%

*Includes IBM's Fixed Term Rental Plan, Extended Term Plan, as well as the use of the newly announced price modifications—Integrated Storage Control, Integrated File Adapter, the 3830-2, the 3333

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Distributor Gets Fresh View of Business

NEWTON, Iowa — The installation of a computer for Newton Manufacturing Co., a distributor in the advertising specialty business, has meant better control of sales and profits through comprehensive and current management reports; faster, more efficient and more complete accounting operations; and the capability to expand volume without incurring proportionate processing costs.

"We've been in business since 1909 yet the computer is giving us a grasp of our business that we never had before," Newton President William DeJong said.

"The computer enables us to provide better customer service through improved internal operations," he said.

Newton's NCR Century 100 system includes a central processor with 16,384 characters of memory, a dual disk memory unit capable of holding more than 8.4M characters of information, a 450 line/min printer, an I/O typewriter and controller for operating an on-line NCR 736 magnetic tape encoder for data input and output. Together with four 736 encoders to record data off-line and 40 disk packs, the system leases for less than $4,000/mo.

Applications on the system include order entry, invoicing and sales accounting, according to Mancil R. Laidig, secretary-controller. Among the most significant reports and analyses produced are:

- Daily gross profit report.
- Monthly vendor analyses.
- Monthly sales activity report.
- Monthly sales tax report.

The DP staff includes a manager, program analyst, computer operator, control clerk and seven encoder operators. All computer programs were prepared internally using NCR Neat/3.

The company maintains 300 to 400 sources of supply which fill the orders and ship directly to customers.

Incoming orders go to the sales department where they are reviewed and certain statistical information is taken off. Following credit approval, they are checked for validity and completeness, tax-coded, and factory unit costs are added. All pertinent data concerning each order is then recorded on magnetic tape.

Each day's order data tape is entered in the system which validates the data, calculates salesman commissions and updates a commission disk file. An open order disk file is then updated and a daily order listing is printed out.

When vendor invoices are received indicating customer shipments have been made, pertinent invoice data is entered in the system and matched against the open order disk file, deleting affected records from this file while creating a billing disk file.

The billing disk file is passed against a tax rate disk file to calculate sales and use taxes and update both files in terms of these taxes. The computer then prints out invoices, the daily gross profit report, a detailed sales listing by order and accounts receivable ledgers which are used to prepare statements and post cash receipts.

Each week, a production analysis is produced which provides complete detail on all orders by sales representatives.

Newton plans to expand its computer operations to include accounts receivable statement preparation and posting; complete commission accounting, including checkwriting and accounts payable.

Users Getting to Know Facilities Management

CAMBRIDGE, Mass. — There is a growing acceptance of the facilities management concept by users, especially those who spend from $1 million to $5 million annually on computer services.

That is the conclusion of ADL Systems, Inc. here in a recent report on the $200 million facilities management market.

Big Savings

For the users in the $1 million to $5 million class, the firm reported in *The Casebook*, a newsletter it issued, the savings from using facilities management can run up to 25% of their data processing bill.

The prime requirement for successful implementation of facilities management by a computer user is the willingness to turn over complete control of the activities to be managed to the outside firm, including "hire-fire" control, the newsletter stated.

The four major types of benefits reported by companies using facilities management properly are general improvement in operating performance, substantial cost reductions or controls, "permanent solution" to chronic internal problems, or "temporary solutions" to problems requiring immediate attention or specific types of skills.

Dissatisfaction

The initial decision to investigate facilities management is often based upon frustration, usually resulting from a "cumulative dissatisfaction with the results of in-house EDP efforts."

Although such psychological factors act as catalysts, the final selection process is often based on concrete planning and well-defined expectations, the firm noted.

Although facilities managers can offer advantages across a broad spectrum, the service is so new that many potential problems are just now starting to surface, the report said.

Some of the more recent problems cited by the report are:

- Overcommitment by the facilities manager, most commonly seen in a lack of depth and resources, loss of key staff personnel and financial failure.
- Poorly constructed contractual agreements, without an adequate "good faith commitment by either or both parties."
- Improper preparations by the user, which "is evidenced by a continuing series of changes in direction, project priorities and personnel interfacing."

NCIC Records Growing

WASHINGTON, D.C. — The number of records in the FBI's National Crime Information Center is approaching four million, including 118,000 wanted persons and 176,000 criminal histories.

The current record for daily transactions is 110,025.

Novar 5-50 and 5-60 terminals can receive incoming data at high speeds, up to 2400 bits-per-second, and record the data on tape. Then, off-line, the tape can be used to drive the terminal's Selectric printer at 15 characters-per-second, or a Novar 5-80 Auxiliary Printer at speeds up to 50 cps using 96 character sets. Fifty cps on-line too using the terminal's buffer.

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CI Notes

National On-Line Net Due?

CULVER CITY, Calif. – A new nationwide on-line service bureau may be in the offing.

Transamerica Computer Co. has signed a contract with Computer Communications Inc. for a joint study and design of a nationwide "on-line management information service network," which, if feasible, would be operated by a subsidiary of Transamerica.

The present study is for a system based on the CCI-7000 communications processing system and CCI's CC-30 communications displays and would be interconnected by voice-grade leased lines nationwide, the firms said. The computer systems which would be at the heart of the system have not yet been chosen.

Memory Goes to Sea

WOODLAND HILLS, Calif. – A new core memory system for shipboard applications, the Store/333M, has been developed by Data Products Corp.

The memory features a cycle time of 750 nsec and access time of 325 nsec. It has a basic storage capacity of 8K by 18 bits on a double-sided board. Memory capacity can be expanded to 32K by 18 in 8K increments.

Fire Hits CFI Memories

ANAHEIM, Calif. – CFI Memories, Inc. sustained a sizable fire loss at its facility here recently.

The disk pack maker reported major damage in the company's substrate machinery line, with lesser damage in the coding, assembly and production test lines. There were no personal injuries.

Supershorts

Computer Machinery Corp. reported that the aggregate rental revenue generated by CMC equipment within the U.S. has exceeded the $1 million mark per month.

Centronics Data Computer Corp. reached an agreement with Brother Industries, Ltd. of Japan, under which Brother will manufacture and supply, and Centronics will purchase through Brother International Corp. (an international sales affiliate of Brother Industries), all of Centronics' requirements for mechanical portions of impact printers being marketed by Centronics, as well as such future products as the parties may agree upon.

Science Accessories Corp. has appointed three new representative firms for the sale of its Graf/Pen digitizer: Data Marketing Associates, headquartered in Houston, A&D Devices, Inc. of Rochester, N.Y., and G&A Electronics of Livingston, N.J.

Boothe Data Systems has reported a corporate name change to Infonational, Inc.

Homemade Integrated Circuits

Americans Surprised at Chinese DP Level

By E. Drake Lundell Jr.
Of the CW staff

BOSTON – U.S. computer experts just back from a visit to the Chinese mainland were generally surprised at the state of computer technology in that country.

"We were surprised at some of the things we saw," Severo Ornstein of Bolt, Beranek and Newman, Inc. said last week. "But that surprise was probably due to our low expectations."

Even more "impressed with the progress they have made" was Professor Thomas E. Cheatham Jr., director of Harvard University's center for research in computing technology.

Third Generation

"We saw operational, third-generation computers using integrated circuits, all home-built. This really shocked us. It puts them ahead of the Russians in this technology," he said, noting "the Russians have to import their integrated circuits."

While Ornstein also expressed some surprise at the integrated circuit machines, he noted that the six-man U.S. group only saw three of this type of machine during the two-week visit.

In all, he said, the group only saw about six computers, adding that they all appeared to be "one of a kind" models.

The machine described by Cheatham was working at a research institute of the Chinese Academy of Sciences in Peking, which he described as the key center of computer research in China.

The unit was a fairly large machine by Chinese standards, but would probably fall within the small to medium class by U.S. standards, he said.

It had 32K 48-bit words of core memory and 256 18-bit words of thin film memory, he said. Floating-point additime was 2 μsec, and the unit supported a host of peripherals, including a controlled-beam CRT, drums, magnetic and paper tapes and printers, he said.

While the fact that the Chinese were making their own integrated circuits surprised the visitors, they were quick to note that the state of Chinese integrated circuit technology is limited.

The peripheral equipment in use and the I/O capabilities were "extraordinarily limited," Ornstein added.

There were no card readers seen on the tour Ornstein continued, and the tapes and punches were slow. He also said there were no disk systems observed on the visit.

Cheatham said the peripherals were "definitely not third generation" and noted the Chinese did not have large or fast drums or tapes.

At the same time, however, Cheatham said, "their output printers run at about 600 line/min, compared to, say, 1,000 lines for ours. But their vacuum-controlled tape drives seem very nearly as good as ours."

Ornstein observed, however, that the width of the printers was about half that of the standard U.S. printer.

The Chinese machines, Cheatham stated, are programmed in a modification of Algol/60. "The Chinese are building a Fortran translator," he added.

The primary emphasis of the Chinese development of computers has been on development of scientific applications, according to Cheatham, as opposed to business applications.

At the same time, he said "we were told of work on engineering calculations for bridges and dams, on weather forecasting, and on speech recognition.

"Their next big push, I believe, will be toward time-sharing as their peripheral equipment gets better," he added.

Most of the applications appeared to be similar to those developed in the early days of computer use in this country, Ornstein went on, and the machine architecture was also similar to that of the early U.S. machines as far as he could tell.

The people, he said, were extremely up-to-date on most recent developments in the computer field and in some application areas.

The group could not definitely estimate how many computers were actually in use in China, but Ornstein said it was a "very limited" number of machines.

Merger Activity Among DP Firms Declines 14% in 1st Half of '72

CHICAGO – Merger activity has fallen off in the computer industry, according to W.T. Grimm & Co., a consulting firm here which specializes in mergers.

In the first six months of 1972, merger activity in the computer services and manufacturing fields was off by 14% compared with the activity in the first six months of 1972.

In all, there were 61 mergers announced in the 1972 period, down from the 71 reported in the 1971 period, Grimm reported.

Where information is available, Grimm said, nine mergers were for cash, none were for debt securities, 21 were for stock and seven were for a combination of equity, cash or debt.

In the same period in 1971, 11 mergers were for cash, one for debt, 21 for stock and five were of the combination variety.

The sales of divisions, product lines and subsidiaries also declined in the computer field in 1972, Grimm said. In all, there were 33 of these types of sales, compared to 48 in the first six months a year ago, the firm said.

The study also showed that for the first six months there were two incentive payments or earn-out transactions based on expected future earnings, down from five such transactions in the same year-earlier period.

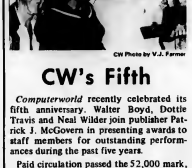
There were no tender offers during the period, compared with one a year ago, the firm reported, noting that in 1972 there were 17 public companies that sold, compared with 28 a year ago.

The statistics for the computer industry run counter to those for the industry at large, Grimm said. In all, the firm reported that nationwide merger activity was up 13%, reversing a two-year downward trend in mergers. In all, there were 2,478 mergers in the first six months of 1972, compared with 2,198 in the same 1971 period.

The current upsurge in activity is due in large part to improved corporate earnings and better economic conditions, according to W.T. Grimm, president.

"There has been a reduction of pressure on corporations to eliminate weak divisions or product lines. What is taking place, and we believe will continue, is the return to the buyer market of growth-conscious companies seeking total ownership," he said.

"Despite all the uncertainties which can cause sharp reactions in the stock market, we look for a continuation of the slowly rising merger trend and a 1972 year-end increase of 10% to 15% over 1971 on a combined industry basis," he added.



CW Photo by V.J. Farmer

CW's Fifth

Computerworld recently celebrated its fifth anniversary. Walter Boyd, Dottie Travis and Neal Wilder join publisher Patrick J. McGovern in presenting awards to staff members for outstanding performances during the past five years.

Paid circulation passed the 52,000 mark, it was announced at the anniversary party.

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Funding Software Development Projects Seen Complex Due to Poor Projections

By a CW Staff Writer

NEW YORK – It is always better to spend someone else's money in funding software development projects than your own money, according to E.D. Hasty, manager of product marketing for National CSS.

"Funding software development is a rather simple topic and a rather complex one all at the same time," Hasty said.

The complexity, he added, "lies in the source of the funding, the justification for the funding, the application of the funding and finally the funding level."

Hasty is involved in making decisions like these, since National CSS spent more than $1 million of its own funds on software development last year and also spent $150,000 of customer-funded money on software projects.

Software development, he said, is always an expensive proposition.

"Programmers are worse than engineers – their estimates are always very much lower than reality proves the case to be. Then comes the product testing and the bug fixing and the customer dissatisfaction and the lost revenues. It adds up in a heck of a hurry."

Consult Salesmen

Although he warned that salesmen could sometimes be overenthusiastic in projecting markets, Hasty said they were generally good sources of information for a firm on needs in the marketplace.

"The salesman still has the most intelligent comment available on where to spend development funds. Who has better contact with the customers for the finished product?"

The major reason for failure of many software projects in the marketplace, he said, is because a solution is found for a non-existing problem.

"In these cases the solution is usually conceived by a technical mind which wrapped itself around the solution, rather than the problem."

But just as often, "the elegance of the solution gets in the way," he said. "The program offered is a jack hammer to swat a fly.'

"The judgment in allocating development funds must certainly take this into account. Misapplication of constructive ingenuity is the most insidious of all the multitude of pitfalls facing the software development decision."

A third factor that often causes failure in software development projects is misjudging the marketplace for the finished product, Hasty said.

"It's a lot easier to estimate than it is to do research," he noted.

"The single most effective test of the wiseness of a development decision that I have found is – can you sell it?" he said.

Some Marketability

"If someone will pay hard money to have a software program developed, it has at least some marketability.

"If more than one paying customer can be found, the prospects for the decision to be a wise one improve exponentially. The key, of course, is that the paying customer be willing to fund the development for the usefulness of the program to himself; not as an investment.

"It should be noted," Hasty claimed, "that almost all of the very successful software developments have been accomplished through customer funding and customer sponsorship. Mark IV, Ramis, Simscript are excellent examples."

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Group/3 has supplied to its subscribers lengthy evaluations of such new products as the Bridge Data 80-column card reader and Data Decision's data recorder. These tests are run over weeks of time on Group/3's computer. This is objective information available from no other source. There are other evaluations in the works.

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- Assembling on the System/3: an evaluation of available programs
- Product Evaluation: 80-Column Card Reader from Bridge Data Products
- Group/3 Announces Information Retrieval Package
- User of the Month: Associated Colleges

July, 1972

- Disc Cartridges.....$105!
- Product Evaluation: Data Recorders from Decision Data
- 360/20 Users can now Step up to System/3
- By the Numbers: a system for alphabetic order
- User of the Month: Union Pacific Mining.

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*Copies of these letters are on file at Group/3 offices and will be made available to interested parties on request.

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Sycor Markets Cassette to OEM

ANN ARBOR, Mich. – Sycor, Inc. is offering its Model 135 Ecma compatible cassette recorder to the OEM market. The 135 reads and writes phase-encoded data at 12.5 in./sec, for a data rate of 10k bit/sec at 800 bit/in. packing density.

Storage capacity is 250,000 char./side. The unit incorporates one bidirectional servo-controlled capstan, two torque-controlled reel motors and a loading mechanism on a common reference plate.

The 135 may be purchased with or without electronics, which include two tape editing system and relocatable assembler. The Grisette II is available in read/write, read only or write only modes.

Data rates for both read and write are 270 char./sec. Operation can be under interrupt control, and an auto-load option is available.

Other New OEM Products

The PI-1400 tape transport module from Precision Instruments, Palo Alto, Calif., is available to the OEM market with or without circuit boards or power modules.

Standard tape speeds are 12.5-, 25-, 37.5- and 45 in./sec. The transport costs less than $2,500.

– – –

The $750 Six-Sixty standby power system from Terado Corp., St. Paul, Minn., provides up to 3,000 W and includes battery, analog computer charging system, DC to AC output inversion system and automatic load transfer circuits.

– – –

The IC 2511 cassette drive from Interdyne Co., Calabasas, Calif., features a 16 kbit/sec transfer rate, a read/write speed of 20 in./sec. The unit offers dual-threshold detection and is Ecma/Ansi compatible, and sells for $400 in OEM quantities.

– – –

Motorola Semiconductor Products Inc., Phoenix, has added two dual multiplexers with latches to its MECL 10,000 series. The MC10132 includes a common Select and Reset for its two latches, and the MC10134 has separate latch Selects and no reset.

Sycor 135 Cassette

Precision Instruments PI-1400

The RM Series of power supply modules from Spellman High-Voltage Electronics Corp., Bronx, N.Y., is designed primarily for CRTs and other electro-optical devices and uses a new ferrite-core RF-transformer.

– – –

Audio Instruments, Mountain View, Calif., has developed a 6.9 lb magnetic tape recorder for severe environmental conditions. The Model AI-101 uses a continuous loop cartridge with up to eight tracks. Prices start at $2,830, with 60-day delivery.

New OEM Products

cards containing read/write and control electronics. In lots of 100, the unit costs $525, including electronics. Delivery is 30 days from 100 Phoenix Drive, 48104.

GRI Offers Software in Cassette

NEWTON, Mass. – GRI Computer Corp. has announced the Grisette II cassette system for use with its GR199 computers as a replacement for paper tape. The complete system, including interface/controller and operating system software sells for under $1,000.

Software includes diagnostic programs and utility programs and a relocatable loader, relocatable library loader, source

Contracts

Univac has been awarded an $8.8 million fixed-price contract for computer test sets and data by the Air Force.

Eastern Systems Management, Inc. has been retained by Commonwealth Information Corp. to provide systems management services.

Mathematical Applications Group, Inc. has been selected by Arnold Bernhard & Co. to supervise and process all data related to the Value Line Investment Survey's stock market judgment contest.

Hazeltine Corp. has received a $380,000 contract from Philco-Ford Corp. for additional Model 4000G Graphic Display systems for use in the Houston Manned Spacecraft Center.

Computer Sciences Corp. has received a $219,000 contract from the Federal Aviation Administration for technical assistance in planning, design and analysis of a totally integrated communications system for air traffic control operations.

EMR Computer has been awarded a contract by the National Environmental Satellite Service for a 6135 system to perform data acquisition from orbiting weather satellites.

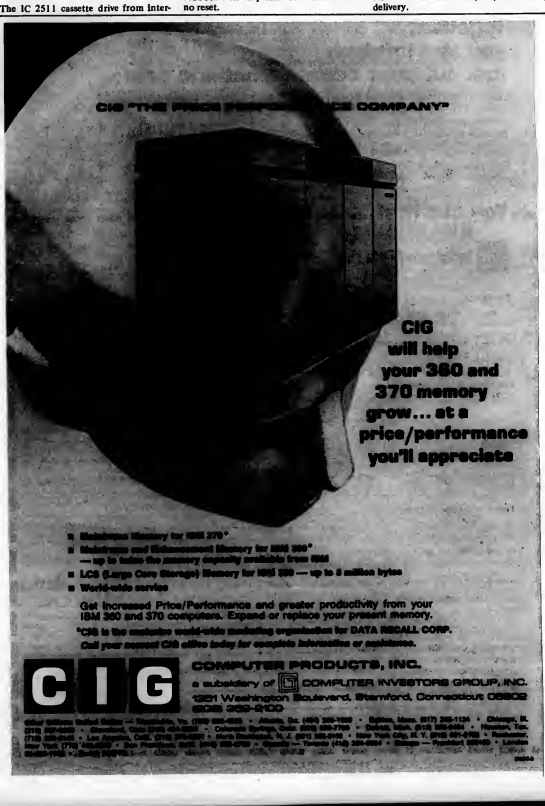
The Law Enforcement Assistance Administration has awarded contracts to Mitre Corp. and the Aerospace Corp. for evaluation and development programs of equipment ranging from police communications to electronic recording and computer scheduling systems for courts.

Sperry Rand Corp. has been issued a $1.1 million fixed-price contract for maintenance of government-owned DP equipment at Wright-Patterson Air Force Base.

Computer Sciences Corp. has received a contract from Chinese Petroleum Corp. of Taiwan for development of a computer-based information system.

Incotel, Ltd. has been selected by the Japanese Computer Usage Development Institute to familiarize and train a group of business executives on computer system design, operation and maintenance problems.

National Information Systems Corp. will perform utilities management services for Farmers Bank, Delaware, for five years. The bank will offer on-line services to other financial institutions.



Educational, Scientific Consortium

CDC Finally Penetrates Polish Time-Sharing Market

By Bohdan O. Szuprowicz
Special to Computerworld

WARSAW, Poland – Following an IBM 360/50 and a French CII Iris 80 as the first two time-sharing systems to be installed here, Control Data finally penetrated the Polish time-sharing market with the sale of a large Cyber 72 computer installation.

And some sources indicate the Polish market could go as high as $50 million a year for U.S.-made equipment.

Control Data could be regarded as a pioneer time-sharing installation supplier in Eastern Europe. The first time-sharing center was a CDC 3300 in Bratislava in 1969. It was not only a first in Czechoslovakia but in all Eastern Europe.

Control Data finds its best clients in the East in nuclear research. A CDC 1604 has been on the air at the Soviet Dubna Institute of Nuclear Research near Moscow for a few years and there recently were negotiations regarding a CDC 6200 for that installation.

In Yugoslavia a CDC 3600 is installed at a high energy physics institute and a CDC 3300 at Josef Stefan Institute for nuclear research. There is talk about updating the 3300 to a CDC 6400 soon. In East Germany Control Data is reported to have as many as 12 installations.

New T/S Center

The contract for the Cyber 72 installation was signed last February in Warsaw and the new time-sharing center will be known as "Cyfronet-1" and is scheduled to be on the air by December. It will serve a consortium of Warsaw scientific and educational institutes.

The leading subscriber and apparently prime mover in the project is the Polish Nuclear Research Institute.

The system, located in Swierk, will be shared with the Warsaw University, Warsaw Polytechnic, Central Planning and Statistics School, Physics and Physical Chemistry Institutes of the Polish Academy of Sciences and a few others.

10 I/O Processors

The Cyfronet-1 installation consists of the Cyber 72 central processor with a 65K 60-bit word memory and is expected to have a speed of 900K operation/sec which would make it the fastest computer in Poland. The system is equipped with 10 I/O processors, each with 4K of 12-bit word memory for handling communications from subscribers.

Twelve I/O channels will initially handle 11 terminal installations, 10 of which will be at various subscribing institutions in Warsaw with one at the computer center in Swierk. The center will be connected with Warsaw by a specially conditioned telephone line capable of handling up to 12 multiplexed transmissions.

Peripherals

The central computer will also be equipped with a large (for East Europe) array of peripherals. Six CDC 841 disk drives and five magnetic tape drives are planned; four will be 9-channel 659 units and one a 7-channel 657 unit. The installation also includes a Calcomp 563 plotter and communications controllers and adapters.

The Poles plan to use some of their own K-202 minicomputers as satellite terminals in the Cyfronet time-sharing systems.

Earlier this year Andrzej Targowski, a high-ranking official of the Polish National Informatics Bureau, visited New York and was reported to have said that as much as $50 million was made available for foreign computer purchases in the near future.

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Orders & Installations

Tufts University has ordered a Decsystem 1040 computer from Digital Equipment Corp. The system will have 32 terminals located at the Medford, Mass., campus and also some at the Medical and Dental School campus seven miles away.

Farm Bureau Life Insurance Co. and Farm Bureau Mutual Insurance Co. have ordered a Honeywell Model 3050 system for customer billing and premium processing for insurance policies, claims processing and membership file maintenance.

Lockheed Aircraft Co. has ordered a Xerox Sigma 3 computer for use in fatigue testing on the Navy's s-3A antisubmarine patrol aircraft.

United Air Lines has installed two IBM 360/195s to handle the Apollo passenger information system. The 195s replace 360/65s.

The State National Bank of Connecticut has installed a Univac Series 70/3 system, with another on order. The system is being used to prepare programs for the bank's accounting systems with programmers entering data through CRTs. The systems will also be used for customer service work.

The U.S. Navy is installing Information Management Inc.'s Upgrade, a 1401-to-Cobol translator, in 14 locations.

The State of Michigan Highway Department has installed 12 Computer Automation, Inc. Model 808 minicomputers as part of a plan to produce current data on traffic volume for highway control and planning. All minis operate in remote traffic recorder stations.

Garfinkel's has ordered 343 NCR 280 point-of-sale terminals and associated equipment, including an NCR 725 in-store computer. The store plans to convert all outlets to point-of-sale equipment over the next 18 months.

Computer Communications Inc. has received an order for 105 CC30 display/communications terminals from the Midwest Stock Exchange Service Corp. for its Signet 80 brokerage systems.

Midland National Bank of Milwaukee, Wis., has installed a second Burroughs B3500 for its service bureau program.

General Public Utilities Corp. has ordered Computer Products Inc.'s RTP 7400 line of analog/digital interface equipment to link a Nova 1200 to an on-line nuclear reactor monitoring system at Three Mile Island, Pa.

Western Pennsylvania National Bank, McKeesport, Pa., has installed a Burroughs B3500 computer primarily for processing proof and transit operations.

Lottery Board Looking For 'Filled-In' Tickets

HARRISBURG, Pa. – The state Lottery Commission has been using a computer to help solve the mystery of the lottery ticket with a winning number typed in. The state Justice Department is investigating the case and has kept the matter secret.

After a store clerk had validated a lottery ticket with the $50,000 winning number, the commission started cranking out press releases on the fact that the recipient was a Harrisburg flood victim. But then the store manager took a closer look at the lucky ticket, and reported to the commission that "this ticket looks funny."

The ticket was green, of the same paper stock and the printing was like that done by the Philadelphia firm that prints the tickets – even the security control number and date in the same "computer" print as on the other tickets. But the winning number "looked like it was put in with an electric typewriter," according to a lottery spokesman.

Inn's Tickets

The results of a computer check indicated the security number matched those on tickets issued for sale to the Old Stone Inn in Middletown, a spokesman said. The inn's owner, James Morrison, said the inn had not noticed anything different about the tickets it received from the commission, although one of his employees had found two sheets of tickets without numbers.

Morrison speculated that the blank tickets "must have dropped out of a truck taking them somewhere."

A warehouse in Middletown, hit by the recent floods, contained 50 million blank tickets that were being trucked to a military installation to be destroyed, according to Donald J. Frank.

The question is, how many more blank tickets are "floating" around the area.

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World Trade Has Greek Seminar On DP for Police

ATHENS – The World Trade Organization conducted a two-day seminar on computer usage for the Greek Government recently, with police applications and privacy/security among the topics of prime interest.

Melvin Bockelman, manager of computer systems for the Kansas City, Mo., Police Department and David McDonald of World Trade spoke to representatives of city, state and the national government, to orient executives on the practical uses of computers.

There are about 100 computers in Greece today, Bockelman noted. The lectures, in English, were given in the City of Athens Planetarium, and were translated simultaneously into Greek.

Mice Exposed To Chemicals

PINE BLUFF, Ark. – Scientists at the National Center for Toxicological Research here are attempting to detect carcinogenic effects of small dosages of chemicals to which man is constantly exposed.

About 20,000 mice are weighed weekly and, weights are recorded on a set of terminals connected to an on-site minicomputer, which transmits data to an IBM 360 in Washington, D.C. A slight change in weight is often one of the first signs of cancer, researchers noted.

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Computer Automation, DEC

Minimakers' Year Earnings, Sales Soar

Last year was a very good year for a couple of minimakers on the East and West Coasts. Computer Automation, Inc., maker of the Naked Mini, achieved its first year of profitable operations, and Digital Equipment Corp.'s earnings rose 44%.

Computer Automation's revenues for the year ended July 2 more than doubled over those of 1971, totaling $4.9 million compared with $2.2 million.

Earnings rose to $598,864, or 46 cents a share, including a $284,000 special tax-loss credit. Last year the firm lost $125,966, or 13 cents a share.

Fourth-quarter sales reached $1.9 million, a 317% gain over the $567,201 recorded in the same 1971 period. Earnings, including a $133,000 special credit, were $282,594, or 20 cents a share, compared with a loss of $131,525, or 11 cents a share, in the 1971 quarter.

Revenues rose 28% in the year ended July 1 at DEC, to $187.6 million from $146.8 million last year. Earnings climbed to $15.3 million or $1.49 a share from $10.6 million or $1.06 a share.

Strong demand for the PDP-8 and PDP-11 minis contributed to the record sales results, according to President Kenneth H. Olsen, and the PDP 11/45 has received "good customer acceptance."

An improved order rate from customers in the time-sharing, publishing and educational markets in the fourth quarter helped to increase shipments of the Decsystem 10, he added.

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Nickels & Dimes

The SEC suspended over-the counter trading in Computer Microdata Corp. common stock Aug. 3-12 because of the unavailability of current financial information and the sharp increase in the price of the stock. Trading also was suspended for two days in Cogar Corp.

$$$

Orders from the Far East are "picking up significantly" at Electronic Associates Inc.

$$$

Electro-Craft, maker of drive systems, cited the accelerated introduction rate of new peripheral equipment in revealing record sales and earnings for the second quarter and six months ended June 30.

$$$

Pitney Bowes' 19% earnings increase in the second quarter ended June 30 resulted primarily from investment tax credits and increased earnings from foreign operations.

$$$

Pitney Bowes-Alpex, producer of the Spice point-of-sale system, is still deferring all costs and expenses in excess of revenues until it attains "commercial levels of operations" – October at the earliest.

$$$

Rapidata sees the service bureau sector heading in the direction of "higher-speed, remote-entry applications, more complex data-base systems and larger programs for interactive work."

$$$

For two consecutive quarters, MAI's revenues have exceeded those of the previous quarter. In the last three months, about 33% of revenues came from activities which did not exist a year ago.

$$$

Applied Magnetics Corp. had record shipments of $3.9 million in June, and at the end of the month had a backlog of $30.8 million, up from $29.2 million a year ago.

$$$

GRI Computer's sales more than tripled in the year ended April 30, to $1.2 million from $356,000. The year loss was cut to $195,000 from $758,000 in the previous year.

Acquisitions

Stockholders of Syntonic Technology, Inc. have approved the merger of the company into Control Data Corp. Terms of the merger call for issuance of one share of CDC common for every 4.5 shares of Syntonic common.

Brandon Applied Systems Inc. and Rand Teleprocessing Corp. have agreed to merge. The transaction will involve an exchange of 5.6 million shares of Brandon stock for all the outstanding stock of Rand.

Syncom Inc. has acquired Gilmanton Business Forms Co. for an undisclosed amount of cash. Gilmanton will operate as a wholly owned subsidiary.

Moll Associates Inc. has agreed to acquire Cape Cod Financial Services. Both firms provide information processing services to the banking industry in the Boston area.

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TRADE QUOTES

Computerworld Stock Trading Summary

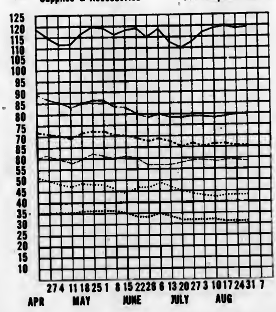
All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass 02139

CLOSING PRICES THURSDAY, AUGUST 31, 1972

EXCH		1972 RANGE (1)	CLOSE AUG 31 1972	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 2	2 1/2	- 1/8	-4.7
A	APPLIED DATA RES.	4- 7	4 7/8	+ 1/4	+5.4
O	APPLIED LOGIC	1- 4	2 1/2	0	0.0
N	AUTOMATIC DATA PROC	72- 99	90	+1	+1.1
O	BRANDON APPLIED SYST	1- 2	1 1/8	- 1/8	-10.0
O	COMPUTER DIMENSIONS	6- 14	6 1/4	+ 1/4	+4.1
O	COMPUTER DYNAMICS	1- 4	1 1/4	0	0.0
O	COMPUTER NETWORK	4- 7	5 5/8	- 5/8	-6.2
N	COMPUTER SCIENCES	6- 10	6 1/4	0	0.0
O	COMPUTER TECHNOLOGY	4- 8	4	0	0.0
O	COMPUTER USAGE	8- 14	7 1/2	-1	-11.7
O	COMP AUTOMDT REPORTS	5- 9	5 1/2	- 1/8	-2.2
N	COMPUTING & SOFTWARE	15- 28	15 5/8	-1 5/8	-8.0
O	COMRESS	1- 3	1 5/8	0	0.0
O	COMSHARE	5- 10	7 1/2	- 1/4	-5.2
O	DATATAB	5- 9	5	- 1/8	-2.4
O	EDP RESOURCES	3- 8	2 3/4	+ 1/4	+10.0
A	ELECT COMP PROG	2- 5	2 1/8	0	0.0
N	ELECTRONIC DATA SYS.	43- 65	53 5/8	- 5/8	-1.1
O	INFORMATICS	6- 11	6 1/4	- 5/8	-9.0
O	I.O.A. DATA CORP	1- 5	2	0	0.0
O	KEANE ASSOCIATES	4- 7	4 1/2	+ 1/4	+5.8
O	KEYDATA CORP	7- 15	12 1/2	- 5/8	-4.7
O	LOGICON	4- 9	6	+ 1/8	+2.1
A	MANAGEMENT DATA	6- 10	5 5/8	- 1/2	-8.1
O	NATIONAL CSS INC	8- 28	24 5/4	0	0.0
P	ON LINE SYSTEMS INC	8- 20	18 3/4	- 3/4	-3.8
N	PLANNING RESEARCH	10- 17	10 3/8	+ 5/8	+3.7
O	PROGRAMMING METHODS	20- 24	22	0	0.0
O	PROGRAMMING & SYS	1- 2	1 1/4	- 1/4	-16.6
O	SCIENTIFIC COMPUTERS	2- 4	2 1/4	0	0.0
O	SIMPLICITY COMPUTER	1- 5	5 7/8	+ 1/8	+3.3
O	TBS COMPUTER CENTERS	4- 6	4 5/8	0	0.0
O	TCC INC	1- 5	1 1/4	- 1/8	-9.0
O	TYMSHARE INC	7- 11	8 3/4	-1 3/8	-13.5
O	UNITED DATA CENTER	5- 8	6	0	0.0
N	UNIVERSITY COMPUTING	13- 26	13 1/2	- 1/4	-1.8
A	URS SYSTEMS	6- 10	8 3/4	0	0.0
O	VORTEX CORP	2- 5	3 1/2	- 1/4	-6.6
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	54- 49	44	+1 1/4	+2.9
O	ADVANCED MEMORY SYS	12- 23	15 1/4	- 1/4	-1.6
N	AMPEX CORP	6- 15	6 1/4	- 1/4	-3.8
O	ANDERSON JACOBSON	5- 8	4 5/8	- 1/8	-2.6
O	ATLANTIC TECHNOLOGY	1- 11	1	-1	-50.0
A	BOLT,BERANEK & NEW	5- 21	17 3/8	-1 5/8	-7.5
N	BUNKER-RAMO	9- 14	10 7/8	- 1/8	-1.1
A	CALCOMP	11- 25	10 7/8	-2 5/8	-17.9
O	CENTRONICS DATA COMP	11- 53	46	-5	-6.1
O	COGNITRONICS	5- 5	5	- 1/4	-7.6
O	COMPUTER COMMUN.	1- 7	2 5/8	- 1/4	-8.6
A	COMPUTER EQUIPMENT	3- 4	2 5/4	- 1/8	-4.5
O	COMPUTER MACHINERY	7- 15	10	+ 5/4	+8.1
A	COMPUTEST	4- 9	4 5/8	+ 1/4	+5.7
A	DATA PRODUCTS CORP	5- 7	4	+ 1/4	+6.6
O	DATA RECOGNITION	1- 5	1 1/2	+ 1/4	+20.0
O	DATA TECHNOLOGY	2- 5	3	+ 3/8	+14.2
O	DI/AN CONTROLS	0- 8	5	- 1/4	-4.7
O	DIGITRONICS	2- 4	2 5/8	- 1/8	-4.5
N	ELECTRONIC M & M	4- 8	4 1/4	- 1/8	-2.8
O	FABRI-TEK	2- 5	5 1/2	- 1/4	-6.6
O	GENERAL COMPUTER SYS	7- 16	10 1/4	- 3/4	-6.8
N	GENERAL ELECTRIC	59- 70	66 1/2	+1 5/8	+2.5
N	HAZELTINE CORP	9- 15	8 3/4	- 1/2	-5.4
O	INFOREX INC	21- 36	22	-4 1/2	-16.9
O	INFORMATION DISPLAYS	1- 5	5	+ 7/8	+41.1
A	LUNDY ELECTRONICS	9- 14	10 1/8	- 1/8	-1.2
O	MANAGEMENT ASSIST	1- 2	1/2	0	0.0
N	MEMOREX	17- 58	17 1/4	-1 1/8	-6.1
A	MILGO ELECTRONICS	17- 44	26 5/8	+ 1/2	+1.9
N	MOHAWK DATA SCI	16- 27	16	- 7/8	-5.1
O	OPTICAL SCANNING	7- 16	10 3/4	-1	-8.5
O	PERTEC CORP	8- 17	10	+1 1/2	+17.6
O	PHOTON	7- 15	8 7/8	- 5/8	-6.5
A	POTTER INSTRUMENT	9- 21	9 1/2	- 3/4	-7.5
O	PRECISION INST.	4- 15	6 1/2	+2 1/2	+62.5
O	RECOGNITION EQUIP	8- 15	7 5/8	- 1/8	-1.6
N	SANDERS ASSOCIATES	13- 21	15 1/2	+1	+6.8
O	SCAN DATA	7- 13	8 1/8	- 5/8	-7.1
O	STORAGE TECHNOLOGY	17- 59	30 1/2	-1 5/8	-5.0
O	SYCOR INC	7- 11	10 1/2	+ 1/2	+5.0
O	TALLY CORP.	8- 15	9 1/8	-1 5/8	-15.1
M	TEKTRONIX INC	34- 64	52 1/8	-2 7/8	-5.2
N	TELEX	6- 15	8 1/4	+ 5/4	+10.0
O	WILTEK INC	10- 26	17	- 1/2	-2.8
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	6- 9	6 1/2	+ 3/4	+13.0
A	BARRY WRIGHT	9- 14	12 5/8	- 1/2	-5.8
A	DATA DOCUMENTS	17- 26	19 5/4	- 1/4	-1.2
O	DUPLEX PRODUCTS INC	8- 16	9	+ 3/4	+9.0
N	ENNIS BUS. FORMS	7- 10	6 5/4	- 5/8	-8.4
O	GRAHAM MAGNETICS	15- 27	18	- 1/2	-2.7
O	GRAPHIC CONTROLS	12- 15	12 1/2	0	0.0
N	3M COMPANY	76- 85	79 7/8	+1 1/8	+1.4
O	MOORE BUS. FORMS	42- 56	54 1/2	-1 1/4	-2.2
N	NASHUA CORP	48- 62	60 3/4	- 5/4	-1.2
O	REYNOLDS & REYNOLD	57- 77	42 3/4	0	0.0
O	STANDARD REGISTER	14- 20	17	- 7/8	-4.8
O	TAB PRODUCTS CO	14- 17	17	+ 1/2	+5.0
N	UARCO	22- 28	22 1/2	- 5/8	-2.7
A	WABASH MAGNETICS	7- 11	7 7/8	- 1/8	-1.5
N	WALLACE BUS FORMS	22- 26	22 5/4	+ 5/4	+5.4
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	147-226	210 5/4	+1 3/4	+0.8
N	COLLINS RADIO	14- 20	15 1/8	- 1/4	-1.6
N	CONTROL DATA CORP	45- 78	74 7/8	+ 3/4	+1.0
O	DATA GENERAL CORP	56-115	101 1/2	+1	+0.9
O	DIGITAL COMP CONTROL	9- 25	11 1/2	+1 1/2	+15.0
N	DIGITAL EQUIPMENT	72-101	94 1/4	+5 1/4	+5.8
N	ELECTRONIC ASSOC.	6- 13	9 5/4	0	0.0
A	ELECTRONIC ENGINEER.	7- 14	7	- 1/8	-1.7
N	FOXBORO	26- 41	27 5/4	-1	-3.4
O	GENERAL AUTOMATION	13- 35	54 1/2	+1	+2.9
O	GRI COMPUTER CORP	3- 5	4 1/8	+ 1/4	+6.4
N	HEWLETT-PACKARD CO	46- 77	71	- 1/8	-0.1
N	HONEYWELL INC	130-170	157	+4 1/8	+2.6
N	IBM	353-426	408 1/2	+1 1/4	+0.3
O	INTERDATA INC	8- 16	12 5/8	- 1/4	-1.9
O	MICRODATA CORP	5- 10	9 1/4	0	0.0
N	NCR	29- 56	35 3/4	+1 3/8	+4.0
N	RAYTHEON CO	52- 47	31 1/2	-2 1/4	-6.6
N	SPERRY RAND	50- 48	45	+ 1/2	+1.1
A	SYSTEMS ENG. LABS	10- 16	9 7/8	- 3/4	-7.0
N	VARIAN ASSOCIATES	14- 22	21 1/4	+1 1/8	+5.5
N	VICTOR COMPTOMETER	15- 24	18 1/8	-2 5/8	-12.6
N	WANG LABS.	34- 61	57 1/4	+ 7/8	+2.4
N	XEROX CORP	121-172	156 5/8	-2 1/8	-1.3
	LEASING COMPANIES				
A	BOOTHE COMPUTER	5- 18	5 5/8	- 3/8	-6.2
O	BRESNAHAN COMP.	2- 3	2 1/8	- 1/8	-5.5
O	COMDISCO INC	3- 18	16	0	0.0
O	COMMERCE GROUP CORP	5- 11	6 1/4	+ 5/8	+6.3
O	COMPUTER EXCHANGE	1- 3	1 1/8	0	0.0
A	COMPUTER INVSTRS GRP	8- 14	9 1/4	- 5/8	-6.3
N	DPF INC	5- 13	5 5/4	- 1/2	-8.0
M	DATRONIC RENTAL	2- 4	1 7/8	0	0.0
A	DCL INC	5- 10	5 1/2	+ 1/2	+10.0
A	DEARBORN-STORM	16- 26	16 5/8	- 1/4	-1.5
A	DPA, INC.	5- 8	5 5/4	0	0.0
A	GRANITE MGT	5- 11	5 5/8	- 1/2	-8.5
A	GREYHOUND COMPUTER	6- 11	6 5/8	0	0.0
A	ITEL	7- 12	8 1/2	- 1/2	-5.5
N	LEASCO CORP	17- 24	21 1/2	+ 7/8	+4.2
O	LEASPAC CORP	9- 15	10	+ 3/4	+8.1
O	LECTRO MGT INC	1- 4	1 1/2	+ 1/4	+20.0
A	ROCKWOOD COMPUTER	2- 7	2 7/8	- 1/8	-4.1
O	SYSTEMS CAPITAL	5- 20	14 3/8	- 1/8	-0.8
N	U.S. LEASING	19- 33	30 7/8	- 5/8	-1.9

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
P=PHIL-BALT-WASH
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index



Earnings Reports

NASHUA
Three Months Ended June 30

	1972	a1971
Shr Ernd	$.59	$.52
Revenue	40,873,000	35,769,000
Earnings	2,536,000	2,241,000
8 Mo Shr	1.03	.91
Revenue	78,555,000	69,645,000
Earnings	4,450,000	3,916,000

a-Restated to reflect acquisition of Best Photo Service Inc. on a pooling-of-interests basis.

COMPUTER MACHINERY
Three Months Ended June 30

	1972	1971
Revenue	$7,522,000	$2,255,000
Spec Cred	a107,000	.....
Loss	803,000	1,124,000
6 Mo Rev	10,707,000	4,480,000
Spec Cred	a107,000	.....
Loss	2,080,000	1,783,000

a-From sale of securities.

INTERDATA
Three Months Ended June 30

	1972	1971
Shr Ernd	$.13	$.06
Revenue	3,118,100	2,158,200
Spec Cred	121,800	91,300
Earnings	253,100	107,400
6 Mo Shr	.25	.....
Revenue	5,959,600	3,588,700
Spec Cred	268,700	.....
Earnings	483,800	(111,100)

STORAGE TECHNOLOGY
Three Months Ended June 30

	1972	1971
Shr Ernd	$.22	.....
Revenue	5,849,000	$213,000
Tax Cred	342,000	.....
Earnings	725,000	(1,399,000)

ADVANCED MEMORY SYSTEMS
Three Months Ended June 30

	1972	1971
Shr Ernd	$.13	.....
Revenue	3,001,202	$317,633
Tax Cred	98,000	.....
Earnings	206,357	(880,147)
9 Mo Shr	.11	.....
Revenue	7,790,698	1,042,483
Tax Cred	80,000	.....
Earnings	170,180	(1,424,288)

BOOTHE COMPUTER
Three Months Ended June 30

	1972	1971
Shr Ernd	$.38	e$.48
bRevenue	12,864,000	15,814,000
Loss Disc Op	.....	153,000
Spec Cred	c850,000	.....
Earnings	757,000	972,000
6 Mo Shr	.58	e.85
bRevenue	27,996,000	30,578,000
Loss Disc Op	.....	238,000
Spec Cred	c1,148,000	.....
Earnings	1,238,000	1,795,000

e-Adjusted for a 10% stock dividend in June 1972. b-From continuing operations. c-From sales of stock of subsidiaries.

ADVANCED COMPUTER TECHNIQUES
Three Months Ended June 30

	1972	1971
Shr Ernd	$.03	.....
Revenue	797,441	$809,537
Earnings	20,837	(21,601)

GREYHOUND COMPUTER
Three Months Ended June 30

	1972	1971
Shr Ernd	$.24	$.24
Revenue	10,679,000	11,766,000
Earnings	1,039,000	1,046,000
8 Mo Shr	.50	.48
Revenue	21,725,000	23,873,000
Earnings	2,179,000	1,985,000

Sierra has a new product folder describing our complete front-end system for collecting factory data.

Write for it.

Sierra Research Corporation
Data Systems Division
217 Middlesex Turnpike
Burlington, Massachusetts 01803
Telephone (617) 273 0900

THE GREAT CRUSADE

A PROGRAM FOR EDP PROFESSIONALS

The computer industry is long overdue for a crusade of its own.

A crusade to help strengthen the leadership of EDP professionals.

Leadership that can be strengthened only through greater productivity.

Productivity which can mean more profitable operations for your company. And a more satisfied customer—your top management.

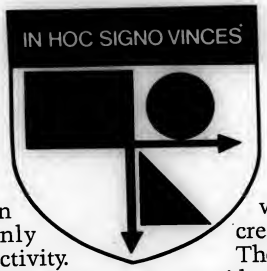
For some time now, EDP professionals have taken their turn in the management frying pan.

You know the questions:

When is our EDP investment going to pay off?

How can we get the reports we need to run this business?

Don't give me more technical acrobatics! When will we see results?



*With this shield we shall conquer.

To help strengthen EDP leadership. This is the mission of The Great Crusade.

Sponsored by Applied Data Research. The Software Builders.

The First Crusade will be devoted to increasing productivity.

The Second Crusade will provide ways to improve program security and maintenance.

The Third Crusade will tell how to strengthen program and project reliability.

The Fourth Crusade will outline strategies for more effective management control.

The Fifth Crusade will pinpoint ways to reduce EDP costs.

The Great Crusade. Over the next few months, you'll be hearing more about it. We invite you to go along. In hoc signo vinces.

APPLIED DATA RESEARCH, INC.
THE SOFTWARE BUILDERS
Route 206 Center, Princeton, N. J. 08540